Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Parts 2, 25, and 73 of the	)	
Commission's Rules to Implement Decisions	)	
from the World Radiocommunication Conference	)	ET Docket No. 04-139
(Geneva, 2003) (WRC-03) Concerning Frequency	)	
Bands Between 5900 kHz and 27.5 GHz and to	)	
Otherwise Update the Rules in this Frequency	)	
Range	)	

REPORT AND ORDER

Adopted: March 10, 2005 **Released: March 16, 2005**

By the Commission:

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I. INTRODUCTION

1. By this action, we are amending Parts 2, 25, 73, 90, and 97 of the Commission's Rules in order to implement allocation changes to the frequency range between 5900 kHz and 27.5 GHz in furtherance of decisions that were made at the World Radiocommunication Conference (Geneva, 2003) (WRC-03) and to otherwise update our Rules in this frequency range.[1] We take the following significant actions for non-Federal operations:[2] (1) realignment of the allocations near 7 MHz, which includes making the band 7100-7200 kHz immediately available to amateur operators in Regions 1 and 3;[3] (2) adoption of the Digital Radio Mondiale (DRM) standard and related actions,[4] which are anticipated to reinvigorate the HF broadcasting (HFBC) service (also known as "shortwave broadcasting");[5] and (3) raising the secondary Earth exploration satellite-service (EESS) allocation in the band 25.5-27 GHz to primary status, thereby meeting the needs of the commercial remote sensing industry for wider bandwidth operations. These and various other decisions adopted herein conform the Commission's Rules, to the extent practical, to the decisions that the international community made at WRC-03 and will collectively promote the advancement of new and expanded services and provide significant benefits to the American public.

II. EXECUTIVE SUMMARY

2. In this summary, we expand on our discussion of the most significant decisions that we are making in this Report and Order. First, we describe our actions that affect non-Federal operations. These actions are limited to the HF (3-30 MHz), UHF (300-3000 MHz), and SHF (3-30 GHz) frequency ranges.

In the HF Frequency Range:

- Authorize the use of double sideband (DSB), single sideband (SSB), and digital transmissions in the HF bands between 5900 kHz and 26100 kHz that are allocated to the broadcasting service and adopt the ITU system specifications for their use.[6]

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[1] *See* ITU *World Radiocommunication Conference Final Acts (Geneva, 2003)* (*WRC-2003 Final Acts*). All WRC-03 decisions have now become effective. *See WRC-03 Final Acts*, Article 59 at Nos. 59.7 and 59.8. However, because spectrum use within individual countries is governed by the respective sovereign entities, not all WRC-03 decisions have been implemented in all jurisdictions.

[2] For purposes of clarity and consistency, we are making a non-substantive change in our spectrum management terminology. Specifically, we are using the adjectives "Federal" and "non-Federal" instead of "Federal Government" and "non-Federal Government." See paras. 131-132, *infra.*

[3] For the allocation of frequencies, the ITU has divided the world into three Regions. The United States, its Caribbean insular areas, and some of its Pacific insular areas are in Region 2, which includes North and South America. Region 1 is primarily Africa, Europe, the former Soviet Union, and the Middle East. Region 3 is primarily the remainder of Asia, Australia, and New Zealand. Certain of the U.S. Pacific insular areas are in Region 3, the most important of which are American Samoa, Guam, and the Northern Marianna Islands. *See* 47 C.F.R. § 2.104(b) for the definitions and map of the three ITU Regions and § 2.105(a) for the lists of U.S. insular areas.

[4] See paras. 2 and 73, *infra.*

[5] The International Telecommunication Union (ITU) subdivides the radio spectrum (3 kHz to 3000 GHz) into nine frequency bands. The frequency range from 3 MHz to 30 MHz is HF (High Frequency). 47 C.F.R. § 2.101.

[6] DSB transmitters transmit the carrier frequency and both sidebands resulting from the modulation of the carrier by the modulating signal. Traditionally, DSB emissions have been used in HF broadcasting, and currently, the Commission's Rules authorize only DSB operations. In contrast, SSB transmission is the method of operation in which one sideband is transmitted and the other sideband is suppressed; the carrier wave may be either transmitted or suppressed. *See The New IEEE Standard Dictionary of Electrical and Electronics Terms*, Fifth Edition. Analog transmission (such as DSB and SSB) is the transmission of a continuously varying signal as opposed to digital

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- Adopt minimum operating power requirements for HFBC stations using SSB modulation (50 kilowatts (kW) peak envelope power (PEP)[7]) and digital modulation (10 kW mean power).[8]
- Require the use of the DRM[9] standard for digital transmissions in the HFBC bands.[10]
- Realign the allocations near 7 MHz to: (1) reallocate the band 7100-7200 kHz to the amateur service on a co-primary basis with the broadcasting service in the U.S. Pacific insular areas that are located in Region 3 until March 29, 2009, at which time this 100 kilohertz will be allocated exclusively to the amateur service; (2) reallocate the band 7350-7400 kHz to the broadcasting service on a co-primary basis with the fixed service until March 29, 2009, at which time this 50 kilohertz will be allocated exclusively for HFBC use; and (3) raise the allocation status of the mobile service in bands 6765-7000 kHz and 7400-8100 kHz to primary and slightly narrow the range of permitted services in those bands by prohibiting the aeronautical mobile route (R) service.[11]
- Authorize FCC-licensed amateur operators that are located within Region 1 or Region 3, but that are not located in another country's area of authority,[12] to operate in the band 7100-7200 kHz on a primary basis; however, until March 29, 2009, these amateur operations must not impose constraints on the HFBC service intended for use within Region 1 and Region 3.

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transmission, which is the transmission of a discretely varying signal. *See Telecommunications: Glossary of Telecommunication Terms*, Federal Standard 1037B.

[7] PEP is the average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle at the crest of the modulation envelope taken under normal operating conditions. 47 C.F.R. § 2.101.

[8] Mean power of a radio transmitter is defined as the average power supplied to the antenna transmission line during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions. 47 C.F.R. § 2.101. In the March 29, 2004 *Notice of Proposed Rulemaking* that initiated this proceeding (see para. 7, *infra*) we used the term "average power." However, ITU Radio Regulation No. 1.156 states that whenever power is referred to in the ITU *Radio Regulations* it must be expressed as either PEP, mean power, or carrier power. In staff discussions, the Broadcasting Board of Governors (BBG) stated that minimum digital HFBC power should be specified in terms of mean power. In order to remove confusion, we will use only the term mean power for digital HFBC transmissions in this Report and Order.

[9] The ITU system specifications for digital HFBC transmissions, which we are adopting in this Report and Order, provide only the basic radio frequency (RF) requirements. The DRM standard builds upon the ITU system specification for digital HFBC transmissions in order to provide manufacturers with all the basic information that they need to build both transmitters and receivers. See paras. 59-74, *infra.*

[10] The Commission has previously authorized the use of an In-Band On-Channel (IBOC) Digital Audio Broadcasting system in the AM (535-1705 kHz) and FM (88-108 MHz) broadcasting bands, which was developed by the iBiquity Digital Corporation (iBiquity). The action that we take today is limited to HF broadcasting and in no way disturbs the transition to iBiquity's technology, which is known as High Definition (HD) Radio, in the AM and FM bands. *See* www.ibiquity.com for more information on HD Radio.

[11] Specifically, we are allocating the bands 6765-7000 kHz and 7400-8100 kHz to the fixed and mobile except aeronautical mobile (R) services on a co-primary basis. The aeronautical mobile (R) service is defined as an aeronautical mobile service reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes. 47 C.F.R. § 2.1. Thus, a mobile except aeronautical mobile (R) service allocation permits all mobile service uses except for this very specialized use.

[12] In addition to their authority to operate in the United States, its insular areas, its territorial waters, and its air space, FCC-licensed amateurs are authorized to transmit when a U.S.-registered vessel is in international waters or when a U.S.-registered aircraft is in international air space because the vessel or aircraft is considered to be part of the United States. FCC Rules apply until the vessel enters the territorial waters of another country or until the aircraft enters the air space of another country. See 47 C.F.R. §§ 97.301, 97.11 (for amateur station requirements aboard ships or in aircraft).

In the UHF Frequency Range:

- Conform the provisional Little LEO feeder link allocations (uplinks at 1390-1392 MHz and downlinks at 1430-1432 MHz) to the *WRC-03 Final Acts*.

In the SHF Frequency Range:

- Allocate the band 5000-5010 MHz to the radionavigation-satellite service (RNSS) and limit the use of this allocation to Earth-to-space transmissions (RNSS uplinks) on a primary basis for Federal and non-Federal use.[13]
- Allocate the band 5010-5030 MHz to the RNSS and limit the use of this allocation to space-to-Earth transmissions (RNSS downlinks) and to space-to-space transmissions on a primary basis for Federal and non-Federal use.
- Raise the secondary non-Federal EESS allocation in the band 25.5-27 GHz, which is limited to space-to-Earth transmissions (EESS downlinks), to primary status.[14]
- Replace the secondary non-Federal EESS allocation in the band 25.25-27.5 GHz, which is limited to space-to-space transmissions, with the broader inter-satellite service (ISS) allocation and limit its use to EESS and SRS applications and to transmissions of data originating from industrial and medical activities in space.[15]

3. Second, at the request of the National Telecommunications and Information Administration (NTIA), we are making a number of allocation changes to the Federal Table of Frequency Allocations (Federal Table),[16] three of which pertain to the space research service (SRS).[17] These allocation changes involve spectrum primarily used by Federal agencies and are anticipated to have limited impact on non-Federal licensees that are authorized to operate in the affected Federal bands. Specifically, we reflect changes to the Federal Table that: (1) allocate the band 432-438 MHz to the EESS (active) on a secondary basis for use mainly outside of the United States; (2) raise the secondary radiolocation service allocation in the band 2900-3100 MHz to primary status; (3) specify that the SRS (deep space) (Earth-to-space) allocation in the band 7145-7190 MHz has primary status; (4) raise the secondary SRS allocation

[13] The RNSS is a radiodetermination-satellite service used for the purpose of radionavigation. This service may also include feeder links necessary for its operation. Radiodetermination is the determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters, by means of the propagation properties of radio waves. 47 C.F.R. § 2.1.

[14] The EESS is a radiocommunication service between earth stations and one or more space stations, which may include links between space stations, in which: (1) information relating to the characteristics of the Earth and its natural phenomena, including data relating to the state of the environment, is obtained from active sensors or passive sensors on Earth satellites; (2) similar information is collected from airborne or Earth-based platforms; (3) such information may be distributed to earth stations in the system concerned; and (4) platform interrogation may be included. This service may include feeder links necessary for its operation. 47 C.F.R. § 2.1.

[15] The ISS is a radiocommunication service providing links between artificial satellites. 47 C.F.R. § 2.1. Thus, non-Federal authority for space-to-space transmissions is expanded from just EESS applications to also include SRS applications and transmissions of data originating from industrial and medical activities in space. There is no change in allocation status. That is, the band 25.25-27 GHz was allocated to the EESS (space-to-space) on a secondary basis for non-Federal use and the ISS allocation also has secondary status.

[16] The Commission, which is an independent agency, administers non-Federal spectrum and NTIA, which is an operating unit of the Department of Commerce, administers Federal spectrum. 47 C.F.R. § 2.105(a). NTIA also approves the spectrum needs of new systems for use by Federal departments and agencies and maintains the Federal Table in its *Manual of Regulations & Procedures for Federal Radio Frequency Management* (*NTIA Manual*). The Federal Table is included in the Commission's Rules for informational purposes only. 47 C.F.R. § 2.105(d)(3).

[17] The SRS is a radiocommunication service in which spacecraft or other objects in space are used for scientific purposes. 47 C.F.R. § 2.1.

in the band 14.8-15.35 GHz to primary status; and (5) allocate the band 25.5-27 GHz to the SRS (space-to-Earth) on a primary basis.

III. BACKGROUND

4. In January 2001, the Commission established the World Radiocommunication Conference Advisory Committee (WRC-03 Advisory Committee) to assist it in the development of proposals for WRC-03. On January 8, 2003, the WRC-03 Advisory Committee finalized its recommendations and forwarded them to the Commission for consideration. In addition, NTIA submitted letters to the Commission containing draft proposals that had been developed by the Executive Branch agencies. By public notice, the Commission requested comment on these recommendations and draft proposals.[18] The *U.S. Proposals for WRC-03* that resulted for this open public process covered many of the items on the WRC-03 agenda.[19] In addition, the United States worked with other administrations in Region 2 to craft Inter-American Proposals.[20]

5. The International Telecommunication Union (ITU), under the auspices of the United Nations, convened WRC-03 from June 9 to July 4, 2003, in Geneva, Switzerland with more than 140 countries participating. WRC-03 considered 48 conference agenda items concerning the deployment, growth and evolving use of a broad range of spectrum-based services. The allocation changes adopted by WRC-03 directly impact Federal and non-Federal use of the radio spectrum. The actions taken at WRC-03 were published as the *WRC-03 Final Acts* and were subsequently codified in Article 5 of the 2004 edition of the ITU *Radio Regulations*.[21] We reflect these frequency allocations in the first three columns of Section 2.106 of the Commission's Rules as the International Table of Frequency Allocations (International Table).[22]

6. Since July 4, 2003, we have taken several actions with regards to domestic implementation of the *WRC-03 Final Acts*. Specifically, we have (1) allocated the band 108-117.975 MHz to differential global positioning system (GPS)[23] stations for the specific purpose of transmitting DGPS information intended for aircraft navigation;[24] (2) broadened the secondary land mobile-satellite service allocation in the band 14-14.5 GHz to a generic mobile-satellite service (MSS) allocation;[25] (3) made numerous

[18] *See Public Notice* entitled "The FCC's Advisory Committee for the 2003 World Radiocommunication Conference Approves Draft Proposals," DA 03-91, released January 15, 2003.

[19] *See United States of America Proposals for the Work of the Conference*, plenary meeting, Document_E, dated February 9, 2003 (*U.S. Proposals for WRC-03*); *United States of America Proposals for the Work of the Conference*, plenary meeting, Agenda Item 1.16, Document 38-E, April 28, 2003.

[20] *See* Organization of American States, Inter-American Telecommunications Commission (CITEL), Inter-American Proposals for WRC-03, Parts 1, 2, and 3, dated April 21, 2003.

[21] *See* ITU *Radio Regulations*, Edition of 2004 (ITU *Radio Regulations*) at Article 5 (Frequency allocations), Section IV (Table of Frequency Allocations).

[22] 47 C.F.R. § 2.106. The International Table is subdivided into the Region 1 Table (column 1), the Region 2 Table (column 2), and the Region 3 Table (column 3). The International Table is included in the Commission's Rules for informational purposes only. 47 C.F.R. § 2.104.

[23] Differential GPS allows the user to correct for GPS errors and to increase the overall accuracy of the GPS receiver.

[24] Review of Part 87 of the Commission's Rules Concerning the Aviation Radio Service, WT Docket No. 01-289, *Report and Order and Further Notice of Proposed Rule Making*, 18 FCC Rcd 21432 (2003) at para. 85. We also authorized DGPS stations to operate in the band 1559-1610 MHz.

[25] Amendment of Parts 2, 25, and 87 of the Commission's Rules to Implement Decisions from World Radiocommunication Conferences Concerning Frequency Bands Between 28 MHz and 36 GHz and to Otherwise (continued....)

allocation changes in the frequency range 5150-5725 MHz, which included making 255 megahertz of spectrum available for Unlicensed National Information Infrastructure (U-NII) devices;[26] (4) finalized the allocations in the frequency range 36-51 GHz (V-band);[27] (5) adopted new licensing and service rules for earth stations on vessels (ESVs);[28] and (6) proposed service rules and procedures to govern use of earth stations in the aeronautical mobile satellite-service in frequency bands allocated to the fixed-satellite service (FSS).[29]

7. In addition, we have received support and advice from NTIA with respect to the WRC-03 decisions. On January 27, 2004, NTIA, on behalf of the Executive Branch agencies, forwarded its recommendations for the national implementation of the results from WRC-03.[30] NTIA supplemented its recommendations by addressing the EESS (active) at 432-438 MHz on February 20, 2004.[31]

8. On March 29, 2004, we adopted a *Notice of Proposed Rulemaking* (*Omnibus NPRM*) in this proceeding.[32] In the *Omnibus NPRM*, we considered all remaining allocation changes that were made at WRC-03. In response, eight comments and three reply comments were filed.[33] The parties addressed our

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Update the Rules in this Frequency Range; and Amendment of Parts 2 and 25 of the Commission's Rules to Allocate Spectrum For Government and Non-Government Use in the Radionavigation-Satellite Service, ET Docket No. 02-305 and RM-10331, *Report and Order*, 18 FCC Rcd 23426 at 23454, para. 76 (2003) (*Above 28 MHz Report and Order*).

[26] Revision of Parts 2 and 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz band, ET Docket No. 03-122, *Report and Order*, 18 FCC Rcd 24484 (2003) (*5 GHz Report and Order*).

[27] Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations, IB Docket No. 97-95, *Second Report and Order*, 18 FCC Rcd 25428 (2003) (*V-band Second Report and Order*).

[28] Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and 14.0-14.5 GHz/11.7-12.2 GHz Bands, IB Docket No. 02-10, *Report and Order*, 20 FCC Rcd 674 (2005).

[29] Service Rules and Procedures to Govern the Use of Aeronautical Mobile Satellite Service Earth Stations in Frequency Bands Allocated to the Fixed Satellite Service, IB Docket No. 05-20, *Notice of Proposed Rule Making*, FCC 05-14, rel. February 9, 2005.

[30] *See* NTIA Letter from Fredrick R. Wentland, Associate Administrator, Office of Spectrum Management, NTIA, United States Department of Commerce, to Edmond J. Thomas, Chief, Office of Engineering and Technology (OET), FCC, dated January 27, 2004 (NTIA recommendations on WRC-03 implementation).

[31] *See* NTIA Letter from Fredrick R. Wentland, Associate Administrator, Office of Spectrum Management, NTIA, United States Department of Commerce, to Edmond J. Thomas, Chief, OET, dated February 20, 2004.

[32] Amendment of Parts 2, 25, and 73 of the Commission's Rules to Implement Decisions from the World Radiocommunication Conference (Geneva, 2003) (WRC-03) Concerning Frequency Bands Between 5900 kHz and 27.5 GHz and to Otherwise Update the Rules in this Frequency Range, ET Docket No. 04-139, *Notice of Proposed Rulemaking*, 69 FR 33698 (June 16, 2004), 19 FCC Rcd 6592 (2004). Comments on the *Omnibus NPRM* were due July 16, 2004 and reply comments were due August 2, 2004.

[33] See Appendix C for the list of commenting parties. Because American Samoa was not listed under States (a required entry) in the Electronic Comment Filing System (ECFS), comments filed by the American Samoa Amateur Radio Association (ASARA) originally did appear on ECFS until July 21, 2004. Subsequently, the information contained in the ASARA comments was refiled in two separate reply comments, one by ASARA and another by Mr. Gandy, President of ASARA. We have updated the ECFS to include American Samoa under the list of States.

proposals with regard to international broadcast stations, the 7 MHz realignment, EESS downlinks at 25.5-27 GHz, EESS (active) at 432-438 MHz, and Little LEO feeder link spectrum. We received no comments addressing our proposals for the other space radiocommunication services, the RNSS allocations, and the radiolocation upgrade.[34]

9. NTIA further supplemented its WRC-03 recommendations by stating its strong support for the proposed rules in total on October 15, 2004; by addressing footnote US342 (which deals with protection for the radio astronomy service (RAS)) on November 23, 2004; by addressing footnote US87 (which deals with space telecommand use of the band 449.75-450.25 MHz) on January 19, 2005; by addressing footnotes US378 and G118 (both of which deal with Federal operations in the band 1710-1755 MHz) on February 28, 2005; by addressing footnote G42 (which deals with the Federal space operation service in the band 1761-1842 MHz) and the information needed from non-Federal applicants in order to coordinate EESS systems in the band 25.5-27 GHz on March 1, 2005; and by addressing airborne and downlink operations in the bands 1390-1400 MHz and 1427-1432 MHz and footnote US74 (RAS protection in the band 1400-1427 MHz) on March 8, 2005.[35] On January 26, 2005, the Broadcasting Board of Governors (BBG) provided comments concerning HFBC issues.[36]

IV. DISCUSSION

10. In this section, we undertake a comprehensive discussion of all the allocation changes necessary to implement the WRC-03 decisions. As with our introductory section, this discussion is generally organized by frequency range but significantly expands on the key points outlined there.

A. The 7 MHz Realignment and the WARC-92 HFBC Bands

1. Background

11. While the band 7000-7300 kHz is allocated exclusively to Amateur Radio Service in the United States, the usefulness of the upper two thirds of the "40-meter band"[37] is impaired at night by the presence of strong broadcast signals from Regions 1 and 3. Under the WRC-03 transition plan, international broadcast stations will vacate the band 7100-7200 kHz by March 29, 2009, which will result in a dramatic improvement in the usefulness of the 40-meter band. In the following paragraphs, we discuss the HFBC bands, the 40-meter band, WRC-03's realignment of the allocations in the 7 MHz region of the spectrum, and the reallocation's impact on non-Federal licensees in the fixed and mobile services.

12. *The HFBC Service.* International broadcast stations transmit on frequencies between 5900 kHz and 26100 kHz that are allocated to the broadcasting service. These stations can be received at great distances because their signals bounce off the ionosphere and rebound to Earth, often thousands of miles

[34] Space radiocommunication services are defined as any radiocommunication involving the use of one or more space stations or the use of one or more reflecting satellites or other objects in space. 47 C.F.R. § 2.1.

[35] *See* NTIA Letters from Fredrick R. Wentland, Associate Administrator, Office of Spectrum Management, NTIA, United States Department of Commerce, to Edmond J. Thomas, Chief, OET, dated October 15, 2004, November 23, 2004, January 19, 2005, February 28, 2005, March 1, 2005 (two letters), and March 8, 2005.

[36] *See* BBG Letter from John O. Wood, BBG's Interdepartment Radio Advisory Committee (IRAC) Representative to Edmond J. Thomas, Chief, OET, received on January 26, 2005 (BBG Letter).

[37] Amateur operators generally speak in terms of wavelength (instead of frequency). Wavelength (in meters) is equal to the speed of light (typically rounded to 3×10^8 m/sec) divided by the frequency (in hertz). Thus, the band 7-7.3 MHz is known as the 40-meter band.

from their point of origin.[38] Most international broadcast stations are operated by national governments. However, HFBC programs originating in the United States are provided by both Federal and privately operated stations.[39] The Commission licenses international broadcast stations to private entities under Part 73, Subpart F of its Rules.[40] At present, there are 24 private sector licensees that are authorized to operate 67 HFBC transmitters.[41]

13. In the ITU *Radio Regulations*, 2930 kilohertz of spectrum in eight frequency bands is allocated for exclusive HFBC use throughout the world[42] and until April 1, 2007, an additional 790 kilohertz is allocated to the broadcasting and fixed services on a co-primary basis throughout the world (the "WARC-92 HFBC bands").[43] After April 1, 2007, the WARC-92 HFBC bands are allocated to the broadcasting service on an exclusive basis, and at that time, the amount of spectrum allocated for exclusive HFBC use throughout the world will increase to 3720 kilohertz in ten frequency bands. We note, however, that the ITU's transition plan (reflected in international footnotes 5.136, 5.143, 5.146, and 5.151) permits stations to continue to use frequencies within the WARC-92 HFBC bands for their previously allocated purposes (*e.g.*, fixed service) for communications within a country on the condition that harmful interference is not caused to the reception of international broadcast programming.[44]

[38] Numerous factors affect the reception of these transmissions, including the time of day, climate, and atmospheric noise, as well as co-channel and adjacent channel interference from other international broadcast stations around the world. Unlike other broadcasting services where a licensee broadcasts on the same frequency at all times, international broadcasters are assigned frequencies in several bands and vary their transmitter frequency on a seasonal basis to account for changes in propagation conditions, changing programming needs, and interference conditions. The United States participates in international frequency coordination meetings to reduce potential harmful interference to and from foreign HF broadcasts.

[39] All U.S. Government and government sponsored, non-military, international broadcasting has been consolidated under BBG. BBG's HF broadcasters are Radio Farda, Radio Free Asia, Radio Free Europe/Radio Liberty, Radio Marti, Radio Sawa, and the Voice of America. For more information, *see* http://www.bbg.gov/index.cfm.

[40] 47 C.F.R. Part 73, Subpart F – International Broadcast Stations.

[41] The Commission's International Bureau maintains the FCC HF Broadcasting home page at http://www.fcc.gov/ib/sand/neg/hf_web/. In the "Final Winter '04 Version 2" seasonal schedule, the Commission has coordinated the frequencies, days and times of operation, transmitter power, target zones, *etc.* for 24 non-Federal licensees; see http://www.fcc.gov/ib/sand/neg/hf_web/B04FCC02.TXT. Station information for HFBC stations is available at http://www.fcc.gov/ib/sand/neg/hf_web/stations.html.

[42] Prior to WARC-92, the following eight bands were allocated exclusively to the HFBC service on a worldwide basis: 5950-6200 kHz, 9500-9900 kHz, 11650-12050 kHz, 13600-13800 kHz, 15100-15600 MHz, 17550-17900 kHz, 21450-21850 kHz, and 25670-26100 kHz. In addition, the band 7100-7300 kHz was allocated to the HFBC service on an exclusive basis in Regions 1 and 3. On the condition that harmful interference is not caused to the broadcasting service, fixed stations communicating within national borders may continue to use frequencies in the bands 9775-9900 kHz, 11650-11700 kHz, and 11975-12050 kHz. 47 C.F.R. § 2.106, footnotes 5.147 and US367.

[43] At WARC-92, ten bands were allocated to the fixed and HFBC services on a co-primary basis. Eight of the WARC-92 HFBC bands are adjacent to six of the original HFBC bands (5900-5950 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13570-13600 kHz, 13800-13870 kHz, 15600-15800 kHz, and 17480-17550 kHz), one of the WARC-92 HFBC bands is adjacent to the Regional allocation at 7100-7300 kHz (7300-7350 kHz), and one of the WARC-92 HFBC bands is not adjacent to an original HFBC band (18900-19020 kHz). The band 5900-5950 kHz is also allocated on a primary basis to the land mobile service in Region 1 and to the mobile except aeronautical mobile (R) service in Region 2.

[44] 47 C.F.R. § 2.106, footnotes 5.136, 5.143, 5.146, and 5.151. The international footnotes, which are specific to the International Table, are described and listed immediately following the tabular material in Section 2.106 of the Commission's Rules. When an international footnote is adopted by the United States, it will appear in the U.S. Table and is binding on U.S. licensees.

14. Prior to WRC-03, there was also one Regional HFBC allocation. Specifically, the band 7100-7300 kHz was allocated for exclusive HFBC use in Regions 1 and 3 and for exclusive use by the amateur service in Region 2. Because international broadcast stations are permitted to use much higher power than amateur radio operators, HFBC transmissions originating in Regions 1 and 3 can cause interference to amateur service reception.[45] In order to permit the broadcasting service unfettered use within Regions 1 and 3, international footnote 5.142 stated that amateur service use of the band 7100-7300 kHz in Region 2 may not impose constraints on the broadcasting service intended for use within Regions 1 and 3.[46]

15. In the United States, the global HFBC spectrum, including the WARC-92 HFBC bands, has been allocated to the broadcasting service and the Commission has adopted a transition plan (footnote US366)[47] that is equivalent to the ITU's plan for the WARC-92 HFBC bands.[48]

16. Table 1, below, provides an overview of the HFBC bands and the 7 MHz realignment, which will be discussed in detail in the following paragraphs. Specifically, column 3 (titled "Bands prior to the end of the transition periods") lists the original eight HFBC bands (indicated in the Remarks column as "Allocated for exclusive HFBC use"), the ten WARC-92 HFBC bands (indicated in the Remarks column as "WARC-92 HFBC band"), and the Regional allocations at 7100-7300 kHz prior to WRC-03's reallocation decision. Column 2 (titled "Bands at the end of the transition periods") lists the ten global HFBC bands, the two Regional HFBC bands, and the 40-meter band as they will exist at the conclusion of the WRC-03 transition period (March 29, 2009).

[45] The operating power for international broadcast stations must be at least 50 kW (carrier power). 47 C.F.R. § 73.751. Worldwide, most international broadcast stations transmit at least 100 kW, and there are a significant number of stations that transmit at 500 kW. In contrast, amateur stations are limited to 1.5 kW PEP, except that in certain frequency bands, amateur stations are more limited in power. For example, amateur stations are limited to 200 W PEP in the segment: (1) 7.050-7.075 MHz when the station is within Region 1 or Region 3; and (2) 7.10-7.15 MHz. 47 C.F.R. § 97.313. Because international broadcast stations transmit at significantly higher power levels than does the amateur service, the propagation of HFBC signals intended for use in Region 1 and Region 3 often continues into the United States and cause interference to amateur reception.

[46] 47 C.F.R. § 2.106, footnote 5.142.

[47] Footnote US366 currently reads as follows: On April 1, 2007, the bands 5900-5950 kHz, 7300-7350 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13570-13600 kHz, 13800-13870 kHz, 15600-15800 kHz, 17480-17550 kHz, and 18900-19020 kHz shall be allocated exclusively to the broadcasting service. Beginning April 1, 2007, frequencies in these bands may be used by stations in the fixed and mobile services, communicating only within the United States and its insular areas, on the condition that harmful interference is not caused to the broadcasting service. When using frequencies for fixed and mobile services, licensees shall be limited to the minimum power needed to achieve communications and shall take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU *Radio Regulations*. 47 C.F.R. § 2.106, footnote US366.

[48] At the request of NTIA, the fixed and mobile service allocations in the WARC-92 HFBC bands are shown as entries in the U.S. Table and footnote US366 sunsets those allocations by stating that the WARC-92 HFBC bands are allocated exclusively to the broadcasting service as of April 1, 2007. Because of the prolonged implementation period, this action highlights actual use in the United States. In contrast, the fixed and mobile service allocations are not shown as entries in the International Table. Instead, these allocations have been moved into footnotes 5.136, 5.143, 5.146, and 5.151. Amendment of Parts 2, 73, 74, 80, 90, and 97 of the Commission's Rules to Implement Decisions from World Radiocommunication Conferences Concerning Frequency Bands Below 28000 kHz, ET Docket No. 02-16, *Report and Order*, 18 FCC Rcd 3423 at 3429, paras. 11-15 (2003) (*Below 28 MHz Report and Order*).

Table 1: The Ten Global HFBC Bands, the Two Regional HFBC Bands, and the 40-Meter Band as They Will Exist at the Conclusion of the WRC-03 Transition Period (March 29, 2009)

Short Name	Bands at the end of the transition periods	Bands prior to the end of the transition periods	Remarks
6 MHz	5900-6200 kHz: Global HFBC	5900-5950 kHz	WARC-92 HFBC band; unused aeronautical mobile service allocation is being deleted; see footnotes 5.134, 5.136, US366.
		5950-6200 kHz	Allocated for exclusive HFBC use.
40-Meter Band	7000-7100 kHz: At WRC-03, Kenya was added to footnote 5.140 and new footnote 5.141A (the band 7000-7100 kHz is additionally allocated to the fixed and land mobile services on a secondary basis in Uzbekistan and Kyrgyzstan) was added.		Prior to WRC-03, the band 7000-7100 kHz was allocated exclusively to the amateur and amateur-satellite services on a worldwide basis, except that the segment 7000-7050 kHz was: (1) additionally allocated to the fixed service on a primary basis in the five countries listed in footnote 5.140; and (2) alternatively allocated to the fixed service on a primary basis in the six countries listed in footnote 5.141.
	The band 7100-7200 kHz is reallocated to the amateur service in much of the world.	Prior to WRC-03, the band 7100-7200 kHz was allocated for amateur use in Region 2 and for HFBC use in Region 1 and Region 3.	*7 MHz Realignment:* Until March 29, 2009, the band 7100-7200 kHz is allocated for co-primary amateur and HFBC use; thereafter, the band 7100-7200 kHz is allocated to the amateur service on an exclusive basis in much of the world; see footnotes 5.141A-C, 5.142, and US395. Footnote 5.142 (Until March 29, 2009, amateur use of 7100-7200 kHz in Region 2 shall not impose constraints on HFBC in Regions 1 and 3)
Shared with HFBC	7200-7300 kHz is allocated exclusively to the amateur service in Region 2 (no change)		Footnote 5.142 (Amateur use of 7200-7300 kHz in Region 2 shall not impose constraints on HFBC in Regions 1 and 3)
Shared with amateurs	7200-7300 kHz: Regional HFBC band (no change)		Prior to WRC-03, the band 7100-7300 kHz was allocated exclusively for HFBC use in Region 1 and Region 3.
7 MHz	7300-7400 kHz: Global HFBC	7300-7350 kHz	WARC-92 HFBC band; unused aeronautical mobile service allocation is being deleted; see footnotes 5.134, 5.143, US396.
	7400-7450 kHz: Regional HFBC band (reallocated for exclusive HFBC use on a phased-in basis in Region 1 and Region 3)	Prior to WRC-03, the band 7350-7450 kHz was allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis throughout the world.	*7 MHz Realignment:* Until March 29, 2009, the bands 7350-7400 kHz (worldwide) and 7400-7450 kHz (only in Region 1 and Region 3) are allocated to the HFBC and fixed services on a co-primary basis and to the land mobile service (but to the broader mobile service in the United States) on a secondary basis; thereafter, the band 7350-7450 kHz is allocated exclusively for HFBC use, except in the 19 countries listed in footnote 5.143C where the fixed service remains allocated on a co-primary with the HFBC; unused aeronautical mobile service allocation is being deleted from 7350-7400 kHz; see footnotes 5.143A, 5.143B, 5.143D, and US396.
9 MHz	9400-9900 kHz: Global HFBC	9400-9500 kHz	WARC-92 HFBC band; see footnotes 5.134, 5.146, and US366.
		9500-9900 kHz	Allocated for exclusive HFBC use; see footnotes 5.147, US367.
11 MHz	11600-12100 kHz: Global HFBC	11600-11650 kHz	WARC-92 HFBC band; see footnotes 5.134, 5.146, and US366.
		11650-12050 kHz	Allocated for exclusive HFBC use; see footnotes 5.147, US367.
		12050-12100 kHz	WARC-92 HFBC band; see footnotes 5.134, 5.146, and US366.
13 MHz	13570-13870 kHz: Global HFBC	13570-13600 kHz	WARC-92 HFBC band; unused non-Federal fixed service allocation is being deleted; see footnotes 5.134, 5.151, US366.
		13600-13800 kHz	Allocated for exclusive HFBC use.
		13800-13870 kHz	WARC-92 HFBC band; see footnotes 5.134, 5.151, and US366.
15 MHz	15100-15800 kHz: Global HFBC	15100-15600 kHz	Allocated for exclusive HFBC use.
		15600-15800 kHz	WARC-92 HFBC band; see footnotes 5.134, 5.146, and US366.
17 MHz	17480-17900 kHz: Global HFBC	17480-17550 kHz	WARC-92 HFBC band; unused non-Federal fixed service allocation is being deleted; see footnotes 5.134, 5.146, US366.
		17550-17900 kHz	Allocated for exclusive HFBC use.
19 MHz	18900-19020 kHz: Global HFBC	18900-19020 kHz	WARC-92 HFBC band; unused non-Federal fixed service allocation is being deleted; see footnotes 5.134, 5.146, US366.
21 MHz	21450-21850 kHz: Global HFBC (no change)		Allocated for exclusive HFBC use.
25 MHz	25670-26100 kHz: Global HFBC (no change)		Allocated for exclusive HFBC use. Footnote US25 (Remote pickup broadcast stations may be authorized in the band 25850-26100 kHz to on the condition that harmful interference is not caused to HFBC reception)

17. *The Amateur Service.* The amateur service[49] uses HF frequencies for long distance communications.[50] In particular, the band 7000-7100 kHz is allocated to the amateur and the amateur-satellite services on an exclusive basis in much of the world[51] and the band 7100-7300 kHz is allocated to the amateur service on an exclusive basis in Region 2. In the United States, the band 7000-7300 kHz is allocated exclusively to the Amateur Radio Service for these purposes. International footnote 5.142 has been adopted domestically,[52] and thus, the Commission does not act on complaints of interference to amateur service reception in the band 7100-7300 kHz from HFBC signals that are targeted to zones of reception in Region 1 and Region 3, but that nevertheless propagate into the United States and its insular areas.[53] In accordance with the Region 3 Table, the band 7100-7300 kHz is allocated to the broadcasting service in the U.S. Pacific insular areas located in Region 3.[54]

18. FCC-licensed amateur stations that are located in Region 2 are authorized to transmit phone emissions in the segment 7.150-7.300 MHz.[55] FCC-licensed amateur stations that are located in Regions 1 and 3, and those stations located within Region 2 that are west of 130° west longitude or south of 20° north latitude (which includes Alaska, Hawaii, and the U.S. Pacific insular areas in Region 2) are authorized to transmit phone emissions in the segment 7.075-7.100 MHz.[56] Therefore, when communicating between the United States mainland and the U.S. Pacific insular areas in Region 3,

[49] The amateur service is a radiocommunication service for the purposes of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest. 47 C.F.R. § 2.1. The amateur radio service is regulated under Part 97 of the Commission's Rules. 47 C.F.R. Part 97.

[50] During daylight hours, the International Amateur Radio Union (IARU) states that the band 7-7.3 MHz carries the bulk of amateur sky wave communications over distances of less than 1300 kilometers (approximately 800 miles). During winter and during periods of low solar activity, and at other times when the maximum usable frequency (MUF) falls below 10 MHz, the IARU states that the band 7-7.1 MHz (7-7.3 MHz in Region 2) supports the bulk of amateur intercontinental communications during hours of darkness. *See* "Amateur Service Spectrum Requirements at 7 MHz," which is an information paper by the IARU and that is available at http://www.iaru.org/7-MHz-Spectrum.pdf at page 2. In the Commission's Rules for international broadcast stations, MUF is defined as the highest frequency which is returned by ionospheric radio propagation to the surface of the Earth for a particular path and time of day for 50 percent of the reference month. 47 C.F.R. § 73.701(m).

[51] Prior to WRC-03, the band 7000-7100 kHz was allocated exclusively to the amateur and amateur-satellite services on a worldwide basis, except that the segment 7000-7050 kHz was: (1) additionally allocated to the fixed service on a primary basis in the five countries listed in footnote 5.140; and (2) alternatively allocated to the fixed service on a primary basis (that is, the segment 7000-7050 kHz was not allocated to the amateur service) in the six countries listed in footnote 5.141. At WRC-03, Kenya was added to footnote 5.140 and new footnote 5.141A, which states that the band 7000-7200 kHz is additionally allocated to the fixed and land mobile services on a secondary basis in Uzbekistan and Kyrgyzstan, was added.

[52] When an international footnote is adopted by the United States, it appears in the U.S. Table and is binding on U.S. licensees.

[53] Amateur operators may file interference complaints if they receive interference from HFBC signals that are directed to zones of reception in Region 2. In the current seasonal schedule, we observe that several HFBC signals are directed to the United States in the band 7100-7300 kHz.

[54] The operation of stations in the Pacific insular areas located in Region 3 are generally governed by the Region 3 Table. The U.S. Pacific insular areas in Region 3 are: Guam, the Northern Mariana Islands, American Samoa, and several unpopulated or lightly populated islands (Baker Island, Howland Island, Jarvis Island, Kingman Reef, Palmyra Atoll, and Wake Atoll). 47 C.F.R. § 2.105, note 4.

[55] 47 C.F.R. § 97.305(c).

[56] 47 C.F.R. § 97.307(f)(11).

FCC-licensed amateur operators currently must use two frequencies (commonly known as "split frequency" operations).[57]

19. *WRC-03's Allocation Decisions.* WRC-03 took two allocation actions that affect the HFBC service. First, WRC-03 revised international footnote 5.134 to meet the needs of international broadcasters in that it permits the continued use of traditional DSB transmissions (as well as SSB transmissions) in the WARC-92 HFBC bands as HF broadcasters transition to digital technology.[58] Footnote 5.134 also requires the use of "seasonal planning" for the WARC-92 HFBC bands.[59] Specifically, footnote 5.134 was modified to read as follows:

> 5.134 The use of the bands 5900-5950 kHz, 7300-7350 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13570-13600 kHz, 13800-13870 kHz, 15600-15800 kHz, 17480-17550 kHz and 18900-19020 kHz by the broadcasting service as from 1 April 2007 is subject to the application of the procedure of Article 12. Administrations are encouraged to use these bands to facilitate the introduction of digitally modulated emissions in accordance with the provisions of Resolution 517 (Rev.WRC-03).

20. Second, WRC-03 realigned the allocations near 7 MHz in order to expand the worldwide 40-meter band by 100 kilohertz (from 7000-7100 kHz to 7000-7200 kHz).[60] This action partially harmonizes the Regional amateur and broadcasting service allocations in the band 7100-7300 kHz and is a large step in resolving incompatibilities between these services that has existed for many years to the substantial detriment of the Amateur Radio Service. This partial harmonization was achieved by shifting the broadcasting service allocation in Regions 1 and 3 up in frequency by 100 kilohertz (from 7100-7350 kHz to 7200-7450 kHz). In addition, the band 7350-7400 kHz was allocated to the HFBC service in Region 2. Thus, the amount of HFBC spectrum at 7 MHz in Regions 1 and 3 remains constant (at 250 kilohertz); the amount of spectrum that is allocated to the HFBC service in Region 2 is increased from 50 kilohertz (7300-7350 kHz) to 100 kilohertz (7300-7400 kHz); and consequently, at the conclusion of the WRC-03 transition period (March 29, 2009), the amount of spectrum that is allocated for exclusive HFBC use on a global basis (except in the 19 countries listed in footnote 5.143C) has been increased from 50 kilohertz (7300-7350 kHz) to 100 kilohertz (7300-7400 kHz), which is sandwiched between two frequency bands (7200-7300 kHz and 7400-7450 kHz) that will be allocated to the broadcasting service on an exclusive basis in Region 1 and Region 3. We note that the International Amateur Radio Union (IARU) states that this reallocation will result in "a dramatic improvement in the 40-meter band."[61]

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[57] We note that the IARU has developed bandplans for each of the Regions. The IARU Region 1, Region 2, and Region 3 Bandplans limit phone emissions to the segments 7.045-7.100 MHz, 7.050-7.300 MHz, and 7.030-7.300 MHz, respectively. However, prior to WRC-03, there was no amateur service allocation in Region 3 for the band 7.1-7.3 MHz, and thus, the IARU Region 3 Bandplan states that amateur stations shall not cause harmful interference to the broadcasting service in the segment 7.1-7.3 MHz. The IARU Regional bandplans can be viewed at http://www.iaru.org/bandplans.html.

[58] Prior to WRC-03, footnote 5.134 had prohibited traditional DSB transmissions in the WARC-92 HFBC bands.

[59] WRC-97 adopted Article 12 as a simple and flexible seasonal planning procedure for the HFBC bands based on coordination. *See Final Acts* of the World Radiocommunication Conference (Geneva, 1997) (WRC-97), Article 12. *See also* ITU *Radio Regulations*, Article 12 (Seasonal planning of the HF bands allocated to the broadcasting service between 5900 kHz and 26100 kHz). Twice yearly, administrations are required to submit their projected seasonal broadcasting schedules in the relevant frequency bands to the ITU. These schedules cover the following seasonal periods: Schedule A is from the last Sunday in March to the last Sunday in October; and Schedule B is from the last Sunday in October to the last Sunday in March.

[60] The band 7000-7100 kHz is allocated to the amateur and amateur-satellite services on a co-primary basis throughout the world. Prior to WRC-03, the band 7100-7300 kHz was allocated exclusively to the broadcasting service in Region 1 and Region 3 and exclusively to the amateur service in Region 2.

[61] *See* "IARU WRC-03 Final Report from Geneva" at http://www.iaru.org/rel030703.html.

21. In order to provide international broadcasters in the band 7100-7200 kHz with sufficient time to relocate to other frequency bands, WRC-03 adopted a transition period of approximately four years (January 1, 2005 to March 29, 2009). During the transition period, the band 7100-7200 kHz is allocated to the amateur and broadcasting services on a co-primary basis in Regions 1 and 3.[62] After March 29, 2009, the band 7100-7200 kHz is allocated exclusively to the amateur service. Until the conclusion of the transition period, international footnote 5.142 continues to apply to the band 7100-7200 kHz. Specifically, WRC-03 revised footnote 5.142 to read as follows:

> 5.142 Until 29 March 2009, the use of the band 7100-7300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. After 29 March 2009 the use of the band 7200-7300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3.

22. WRC-03 provided this same transition period (January 1, 2005 to March 29, 2009) for fixed and land mobile service licensees in the band 7350-7450 kHz (7350-7400 kHz in Region 2). During the WRC-03 transition period, the band 7350-7450 kHz (7350-7400 kHz in Region 2) is allocated to the broadcasting and fixed services on a co-primary basis and to the land mobile service on a secondary basis.[63] At the conclusion of the WRC-03 transition period, the band 7350-7400 kHz is allocated exclusively to the broadcasting service in Region 2; and the band 7350-7450 kHz is allocated exclusively to the broadcasting service in Regions 1 and 3, except in the 19 countries that are listed in international footnote 5.143C (most are in North Africa and the Middle East) where the band 7350-7450 kHz will remain allocated to the fixed service on a co-primary basis with the broadcasting service.[64] Moreover, at the conclusion of the WRC-03 transition period, the spectrum allocated exclusively to the broadcasting service may continue to be used by stations of the fixed and land mobile services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service.

23. WRC-03 changed the secondary land mobile service allocation in the bands 6765-7000 kHz and 7400-8100 kHz in Region 2 (7450-8100 kHz in Regions 1 and 3) to a primary mobile except aeronautical mobile (R) service allocation, effective March 29, 2009. The transition plan for these bands is set forth in international footnotes 5.138A and 5.143E.[65] This WRC-03 action, in conjunction with the existing primary fixed service allocations, was designed to permit greater flexibility and will also facilitate the use of frequency adaptive techniques, thereby leading to greater efficiency in the use of this spectrum.

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[62] Specifically, WRC-03 revised the ITU's Table of Frequency Allocations (shown as the International Table in the Commission's Rules) for the band 7100-7200 kHz by adding an entry for the primary amateur service allocation (shown as "AMATEUR"), by removing the entry for the primary broadcasting service allocation, and by adding international footnote 5.141C, which reads as follows: In Regions 1 and 3, the band 7100-7200 kHz is allocated to the broadcasting service until 29 March 2009 on a primary basis.

[63] See Appendix A for modifications to 47 CFR § 2.106. In this case, footnotes 5.143A (the Region 3 transition plan), 5.143B (the Region 1 transition plan), and 5.143D (the Region 2 transition plan) are being added to the list of international footnotes.

[64] See Appendix A wherein footnote 5.143C is being added to the list of international footnotes.

[65] While the direct Table entry for the secondary land mobile service allocation in the bands 6765-7000 kHz and 7450-8100 kHz has been replaced with a primary mobile except aeronautical mobile (R) service allocation in the International Table, this allocation upgrade is not effective until March 29, 2009, which is specified in international footnotes 5.138A and 5.143E. Footnote 5.138A states that: "Until 29 March 2009, the band 6765-7000 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis. After this date, this band is allocated to the fixed and the mobile except aeronautical mobile (R) services on a primary basis." Footnote 5.143E states that: "Until 29 March 2009, the band 7450-8100 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis."

24. *Impact on the Fixed and Mobile Services.* As shown in Table 2, below, the Commission has issued 249 call signs (*i.e.*, licenses)[66] (each license contains operating authority for at least one station) for stations in the fixed or mobile services in the ten WARC-92 HFBC bands and the band 7350-7400 kHz (collectively, "the reallocated spectrum").[67] Specifically, the Commission has issued 219 licenses in the Industrial/Business Radio Pool for conventional applications, 18 licenses for Alaska private-fixed stations, six licenses for coast stations, and one license in the Public Safety Radio Pool for conventional applications.[68] Almost half (123 of the 249 licenses) of the affected licenses authorize fixed or mobile operations in the band 7350-7400 kHz. In particular, we note that 41 licensees (with 102 licenses) in the Industrial/Business Radio Pool, 11 licensees (with 18 licenses) of Alaska private-fixed stations, and three coast station licensees (each with a single license) would be impacted by the reallocation of the band 7350-7400 MHz.

25. Most (88%) of the licenses that the Commission has issued for fixed and mobile operations in the reallocated spectrum are in the Industrial/Business Radio Pool.[69] Nearly half of these licenses (102 out of 219 licenses) authorize the use of the band 7350-7400 kHz. We note that fixed and mobile licensees may not generally use frequencies in the reallocated spectrum in the place of other operational circuits permitted by the Commission's Rules.[70] We also note that, by Commission Rule, equipment operating in the reallocated spectrum is required to be capable of transmitting on any frequency in the bands assigned to the particular operation and to be capable of immediate change among frequencies (that is, the equipment is required to be tunable across the specified frequency bands).[71] In Public Notice No. 4126, the Commission made 11.62 megahertz of spectrum available for long distance

[66] In contrast, the Commission had issued 205 licenses as of February 12, 2001. At that time, there were 184 fixed and 21 coast station licenses. Of the 184 licenses for fixed stations, 162 were authorized under § 90.266 for long distance communications, 17 were for Alaska private-fixed stations authorized under § 80.387 to use the carrier frequency 11601.5 kHz, and 5 were for aeronautical fixed stations. Amendment of Parts 2, 73, 74, 80, 90, and 97 of the Commission's Rules to Implement Decisions from World Radiocommunication Conferences Concerning Frequency Bands Below 28000 kHz, ET Docket No. 02-16, *Notice of Proposed Rule Making and Order*, 17 FCC Rcd 2728 at 2734 and 2787, para. 10 and Appendix B (2003).

[67] The number of licenses was obtained by searching each frequency band using the Commission's Universal Licensing System (ULS) on March 5, 2005.

[68] The Commonwealth of the Northern Mariana Islands is licensed (call sign KUP71) to transmit a maximum ERP of 96 watts from a single fixed station using the frequency 15.625 MHz (with a necessary bandwidth of 2.8 kHz) at its Civil Defense Emergency Operation Center in Saipan. Call sign KUP71 authorizing the use of 11 frequencies for disaster communication purposes in Saipan. Because this narrow bandwidth requirement could be met in other bands allocated to the fixed service (*e.g.*, the band 15800-16360 kHz), and since this frequency cannot be used to provide operational communications circuits (47 C.F.R. § 90.20(d)(6)), we believe that this public safety use can continue on a non-interference, unprotected basis to the HFBC service as specified in footnote US366.

[69] The use of frequencies in the range from 2000 to 25,000 kHz by licensees in the Industrial/Business Radio Pool is limited to entities that are involved in: (1) prospecting for petroleum, natural gas, or petroleum products, (2) distribution of electric power or the distribution by pipeline of fuels or water; (3) exploration, its support services, and the repair of pipelines; or (4) the repair of telecommunication circuits. Circuits operating on these frequencies may be used for only certain specified purposes. For example, one of the seven specified uses includes providing standby backup communications for circuits which have been disrupted and which directly affect the safety of life, property, or the national interest or are used for coordinating inter-utility, intra-utility, and power pool distribution of electric power. 47 C.F.R. §§ 90.35(b)(3), 90.35(c)(1).

[70] Specifically, except as provided in Part 90, licensees may not use frequencies in the range from 2000 kHz to 25,000 kHz in the place of other operational circuits permitted by the Commission's Rules. 47 C.F.R. § 90(c)(1)(ii).

[71] 47 C.F.R. § 2.102(h)(3)(iii).

communications under Section 90.266 of its Rules.[72] The reallocated spectrum totals 840 kilohertz (790 kilohertz in the ten WARC-92 HFBC bands plus 50 kilohertz in the WRC-03 HFBC band (7350-7400 kHz)). Thus, only 7.2% of the total spectrum currently specified as being available under Section 90.266 is affected by the reallocation of fixed and mobile service spectrum to the HFBC service. In practice, licensees are licensed for an entire frequency band (*e.g.*, 7300-8100 MHz) rather than for specific frequencies, and thus will not need to modify their licenses in order to use frequencies in the remainder of their licensed spectrum. Also, licensees tend to be licensed on more than one frequency band for use under Section 90.266. Because of the nature of licensing in the reallocated spectrum, as well as the other options available to these licensees, we conclude that the effect on licensees in the fixed and mobile services will be minimal.

26. The Commission has issued 18 licenses (9.2% of the fixed and mobile licenses in the reallocated spectrum) for Alaska private-fixed stations that operate in the band 7350-7400 kHz. All 18 of these licenses authorize the use of the sub-band 7368.5-7371.3 kHz[73] and five of these licenses additionally authorize the use of the carrier frequency 11601.5 kHz.[74] In the *Below 28 MHz Report and Order*, the Commission decided that, after April 1, 2007, Alaska private-fixed stations could continued to use the carrier frequency 11601.5 kHz on the condition that harmful interference is not caused to HF broadcasting.[75] As discussed in paragraph 52, below, we conclude that reallocation of the sub-band 7368.5-7371.3 kHz is not warranted.

27. The Commission has issued six licenses in the Coastal Group radio service in the reallocated spectrum: three for public coast stations and three for private coast stations. Each of the six licenses authorizes a single coast station.[76] The reallocation of the band 7350-7400 kHz affects three of these licensees: Cruiseemail (7350 kHz and 7390 kHz); Shipcom, LLC (7398 kHz); and Sailmail Association (7353.6 kHz and 7378.6 kHz). Since our last review, we note that the number of coast station licenses in the reallocated spectrum has decreased from 21 to 6.

[72] Public Notice No. 4126, titled "2-25 MHz HF Frequency Bands Available for Part 90 Long Distance Communications," dated August 12, 1988; and 47 C.F.R. § 90.266, titled "Long distance communications on frequencies below 25 MHz."

[73] Section 80.387 of our Rules states that the carrier frequency 7368.5 kHz is assignable for point-to-point simplex radiotelephone communications between private fixed stations in Alaska. 47 C.F.R. § 80.387(b). Our licensing records indicate that all of the Alaska Group licensees are authorized to operate in the sub-band 7368.5-7371.3 kHz (indicated as "7.36990, 7.36850[c]" MHz and by emission designator 2K80J3E in the ULS database). That is, each of these licensees is authorized to transmit telephony using single-sideband, suppressed carrier modulation, and the received signal is centered on the frequency 7.36990 MHz with a necessary bandwidth of 2.8 kHz. 47 C.F.R. §§ 2.201 and 2.202(b).

[74] 47 C.F.R. § 80.387(b).

[75] *Below 28 MHz Report and Order*, 18 FCC Rcd at 3430, para. 14. This decision is codified at 47 C.F.R. § 80.387(b), note 5.

[76] The public coast stations are located at: Palo Alto, CA (7316.6 kHz and 7319.6 kHz, call sign KFS); Seabrook, MD (7350 kHz and 7390 kHz, call sign WHX); and Coden, AL (7398 kHz, call sign WLO). The private coast stations are located at: Woods Hole, MA (5948.6 kHz, call sign KXC713); Houma, LA (7301.4 kHz, call sign WPXY244); and San Diego, CA (7353.6 kHz and 7378.6 kHz, call sign WQAB964).

<table>
<tr><th colspan="4">Table 2: Fixed and Mobile Bands Reallocated for HFBC Use</th></tr>
<tr><th>WARC-92 HFBC Bands plus 7350-7400 kHz</th><th>Fixed and Mobile Service Allocations</th><th colspan="2">Number of non-Federal Licenses in Each of the Radio Services that May Be Affected</th></tr>
<tr><td>5900-5950 kHz</td><td>FIXED
MOBILE except aeronautical mobile (R)</td><td colspan="2">1 Coastal Group (MC)</td></tr>
<tr><td>7300-7350 kHz</td><td rowspan="2">FIXED
Mobile</td><td>7300-7350 kHz:
101 Industrial/Business Pool, Conventional (IG)
2 MC</td><td rowspan="2">7300-7400 kHz:
102 IG[77]
18 MK
5 MC
Total = 125 licenses are potentially affected</td></tr>
<tr><td>7350-7400 kHz
(WRC-03 HFBC band)</td><td>7350-7400 kHz:
102 IG
18 Alaska Group (MK)
3 MC</td></tr>
<tr><td>9400-9500 kHz</td><td rowspan="5">FIXED</td><td colspan="2">49 IG</td></tr>
<tr><td>11600-11650 kHz</td><td colspan="2">4 IG and 5 MK</td></tr>
<tr><td>12050-12100 kHz and 13800-13870 kHz</td><td colspan="2">1 IG license in each band.</td></tr>
<tr><td>15600-15800 kHz</td><td colspan="2">62 IG and 1 public safety pool, conventional (PW)</td></tr>
<tr><td>13570-13600 kHz, 17480-17550 kHz, and 18900-19020 kHz</td><td colspan="2">Currently, no license is listed in the ULS for these three WARC-92 HFBC bands.</td></tr>
</table>

2. Proposal and Comments

28. *Proposal.* We proposed to implement WRC-03's realignment of the allocations near 7 MHz with minor modifications.[78] Specifically, because the bands 6765-7000 kHz and 7300-7350 kHz are allocated to the mobile service (not the land mobile service) in the United States, we proposed to adopt two United States footnotes (shown as the *Omnibus NPRM* as USxxx and USyyy) that encompass the broader mobile service, but that otherwise mirrored the international transition plans (footnotes 5.138A and 5.143E[79]). We also proposed to make the primary mobile except aeronautical mobile (R) service allocation in the band 7400-8100 kHz effective as of the effective date of the Report and Order in this proceeding (instead of March 29, 2009). We proposed to add international footnote 5.134 to each of the WARC-92 HFBC bands in the United States Table of Frequency Allocations (U.S. Table), which would require the use of seasonal planning in these HFBC bands.[80]

[77] There are 107 IG licenses in the band 7300-8100 kHz and most (101) of these licenses are authorized to operate throughout the entire band (*i.e.*, 800 kilohertz). Therefore, by the conclusion of the WARC-92 HFBC transition (April 1, 2007), 101 licensees must determine whether they can continue to operate in the band 7300-7350 kHz without causing harmful interference to the broadcasting service (and whether their operations can accept the interference that may occur from high-powered HFBC stations). At the end of the WRC-92 HFBC transition (March 29, 2009), these same IG licensees plus one additional IG licensee must determine whether they can continue to operate in the band 7350-7400 kHz without causing harmful interference to the broadcasting service.

[78] *Omnibus NPRM*, 19 FCC Rcd 6602 at paras. 26-28.

[79] See note 65, *supra*, and accompanying text.

[80] 47 C.F.R. § 2.106. The U.S. Table is described in 47 C.F.R. § 2.105. See note 59, *infra*, which describes seasonal planning.

29. As part of our proposal to allocate the band 7350-7400 kHz exclusively to the broadcasting service on March 29, 2009, we proposed to cease issuing licenses on that date for new non-Federal stations in the fixed and mobile services that would operate in this 50 kilohertz of spectrum.[81] We anticipated that these requirements could be met in other HF bands allocated to the fixed and mobile services. We expressed concerns regarding the addition of the band 7100-7200 kHz to the list of frequency bands authorized for use in Region 1 and Region 3 in the Commission's Rules for the Amateur Radio Service because the great power disparity between amateur stations and international broadcast stations lead us to conclude that the amateur service could not make use of this spectrum in advance of HFBC stations vacating the band.[82]

30. *Comments.* ARRL, the National Association for Amateur Radio requests that the Commission reconsider its assumptions about the practicalities of amateur stations operating in the band 7100-7200 kHz prior to March 29, 2009 (the date by which international broadcast stations are required to vacate this spectrum).[83] ARRL states that for years, several administrations in Region 3 (including Australia, New Zealand, and Western Samoa) have allowed their amateurs to use the band 7100-7200 kHz on the condition that harmful interference is not caused to the broadcasting service, and that since WRC-03, several administrations in Region 1 (Croatia, San Marino, Norway, and Iceland) have taken similar actions.[84]

31. ARRL avers that the inability of amateurs in Region 2 to communicate using telephony other than on a split frequency basis[85] with amateur stations in Regions 1 and 3 is a major handicap and that this makes the band far less useful than it could be for disaster relief and emergency communications.[86] ARRL argues that the 100 kilohertz (7-7.1 MHz) now available to amateurs in Regions 1 and 3 is wholly inadequate for their use on a daily basis, that this region of the spectrum has critically important and unique long distance propagation characteristics during nighttime hours, and that the 40-meter band has proven necessary for communications during weather emergencies between the United States mainland and between the U.S. Pacific insular areas (such as American Samoa and Guam) as well as between these insular areas and nearby countries.

32. ARRL requests that the Commission amend Part 97 in this proceeding to permit access by the amateur service in Regions 1 and 3 to the entire 7000-7200 kHz band, with 7100-7200 kHz on a secondary basis until March 29, 2009, and on a primary basis thereafter.[87] ARRL disagrees with the Commission's tentative conclusion that amateur service cannot make use of the band 7100-7200 kHz in Regions 1 and 3 in advance of the HFBC stations vacating the band because of the great power disparity. ARRL states that this statement is provably untrue now, since there are amateurs operating in Regions 1 and 3 in that segment with some success, and without causing harmful interference to HFBC.

[81] *Omnibus NPRM*, 19 FCC Rcd at 6603, para. 29.

[82] *Id* at paras. 30-31. Section 97.301 of our Rules authorizes licensees to operate an amateur station outside any area where the amateur service is regulated by an authority other than the Commission.

[83] *See* ARRL Comments at 5.

[84] *Id* at 2.

[85] Split frequency operations are discussed in para. 18, *supra.*

[86] *See* ARRL Comments at 4-5. ARRL notes that the 7 MHz band is the only worldwide amateur allocation between 3.8 MHz and 10.1 MHz.

[87] *Id.*

33. James F. Brown (Brown) states that the proposed "re-allocations in the amateur 40 meter band are quite reasonable, and will be supported by the amateur community for the most part."[88] Brown urges, however, that the amateur phone frequencies in the United States be the same frequency band as the phone band for Region 1 and Region 3.[89]

34. The National Association of Shortwave Broadcasters (NASB) supports the allocation of 7350-7400 kHz to the broadcasting service. NASB concurs with our proposal to add footnote 5.134 to the U.S. Table because WRC-03 modified this international footnote to permit the continued use of DSB transmissions as well as SSB transmissions in the WARC-92 HFBC bands as HF broadcasters transition to digital technology.[90] Nickolaus E. Leggett (Leggett) supports allowing U.S. international broadcasters the option of continuing to broadcast using DSB transmission.[91]

35. In its reply comments, ARRL reiterates its strong support for secondary access to the band 7100-7200 kHz in Regions 1 and 3 prior to 2009, states that there is no opposition to early access to this band in Regions 1 and 3, and urges that secondary access be provided for in any Order adopted in this proceeding.[92] The American Samoa Amateur Radio Association and Larry G. Gandy (collectively, ASARA/Gandy) support the comments of ARRL in this proceeding. ASARA/Gandy argue that, during a recent Typhoon which struck American Samoa, communications would have been significantly improved had amateur operators been allowed access to frequencies in the segment 7100-7200 kHz.[93] ASARA/Gandy assert that no harm would be caused to the broadcasting service by this early allocation to the amateur service.

36. BBG supports the HFBC allocation proposals that we made in the *Omnibus NPRM* and it recommends that we consider taking three additional actions in furtherance of the reallocation of the WARC-92 HFBC bands.[94] First, BBG notes that on April 1, 2007, the transition period for the WARC-92 bands will conclude. At that time, BBG anticipates that many out-of-band HFBC operations will seek to relocate to the WARC-92 HFBC bands. BBG encourages the Commission to recommend to its fixed and mobile service licensees in the WARC-92 bands that they carefully evaluate whether their operation can coexist with these high-power stations without causing harmful interference to the reception of international broadcast programming.[95] Second, BBG observes that several of the WARC-92 HFBC bands are not currently licensed for use by the non-Federal fixed and mobile services.[96] BBG recommends that the Commission delete these unused allocations.[97] Third, BBG observes that in 2007,

[88] *See* Brown Comments at 1. These comments are listed in the ULS as being filed on behalf of "james f Rbown." The staff's research leads us to believe that the actual commenter is a Mr. James F. Brown because an amateur license search finds that "Rbown" is not a licensee in the Amateur Radio Service. By contrast, a license search for "Brown, James F" finds five matches.

[89] See note 57, *supra.*

[90] *See* NASB Comments at 1. Specifically, NASB state that they concur with the Commission's proposal as stated in par. 17 of the *Omnibus NPRM*, which we have reproduced in the above text.

[91] *See* Leggett Comments at 2.

[92] *See* ARRL Reply Comments at 2.

[93] *See* ASARA Reply Comments at 1 and Gandy Reply Comments at 1. Mr. Gandy states that he is the President of ASARA.

[94] *See* BBG Letter at 1.

[95] *Id* at 2.

[96] *See* Table 2, *supra*, for the number of licenses that the Commission has issued for fixed and mobile operations in each of the WARC-92 HFBC bands.

[97] *See* BBG Letter at 2.

Schedule B commences on March 25 (not April 1) and thus, BBG recommends that the Commission advance the effective date of the WARC-92 HFBC bands in the United States by one week.[98] BBG states that this action would permit more effective seasonal planning. Finally, we note that no licensee in the fixed or mobile service addressed the impact of the proposed 7 MHz realignment on their operations.

3. Decision

37. We are implementing the proposed realignment of the allocations near 7 MHz with certain minor adjustments. In the paragraphs below, we are making allocation decisions that affect HF broadcasting, the 40 meter band, and the fixed and mobile services.

38. *HF Broadcasting.* We are adopting international footnote 5.134 domestically.[99] This footnote requires the use of seasonal planning in the WARC-92 HFBC bands as of April 1, 2007, and thus finalizes the reallocation of the WARC-92 HFBC bands, which will be allocated exclusively to the broadcasting service on a worldwide basis as of April 1, 2007 (March 25, 2007 in the United States). Seasonal planning and the exclusive allocation of these bands to the broadcasting service will allow international broadcasters to make more extensive use of this spectrum.

39. Consistent with the *WRC-03 Final Acts*, we are allocating the bands 7350-7400 kHz and 7400-7450 kHz to the broadcasting service on a co-primary basis with the fixed service until March 29, 2009. In accordance with the ITU *Radio Regulations*, the use of the band 7400-7450 kHz is limited to international broadcast stations that are located in the U.S. Pacific insular areas in Region 3 and that transmit to either Region 1 or Region 3. After March 29, 2009, the band 7350-7450 kHz (7400-7450 kHz only in Region 1 and Region 3) is allocated exclusively to the broadcasting service. At the conclusion of the WRC-03 transition period (March 29, 2009), this action replaces 100 kilohertz of exclusive Regional HFBC spectrum (7100-7200 kHz), which is being reallocated to the amateur service, with 50 kilohertz of exclusive global HFBC spectrum (7350-7400 kHz) and 50 kilohertz of exclusive Regional HFBC spectrum (7400-7450 kHz).

40. We are reorganizing Section 73.702(f) of the Commission's Rules in order to clarify and correct existing rules and to add the band 7350-7450 kHz to these rules.[100] First, we are subdividing Section 73.702(f) into three paragraphs by establishing new paragraph (g) for the rules that will apply to co-primary HFBC allocations and new paragraph (h) for requirements that will apply to Regional HFBC operation. Section 73.702(f) will apply only to the frequency bands allocated exclusively to the HFBC service. Second, in order to recognize out-of-band operations, we have added the phrase "Where practical," to paragraph (f). Third, we are subdividing the exclusive HFBC allocations into worldwide allocations (which will be listed in Section 73.702(f)(1)) and the Regional allocation (which will be listed in Section 73.702(f)(2)).[101] Fourth, we added an informational note that points to the definitions of the ITU Regions. Fifth, in new paragraph (g), we state that frequencies may be assigned from within the listed frequency bands that are allocated on a co-primary basis and thereafter this rule describes how the frequency bands are allocated. Sixth, the co-primary HFBC allocations are further grouped into worldwide allocations (which will be listed in paragraph (g)(1)) and Regional allocations (which will be

[98] *Id.*

[99] Specifically, we are adding international footnote 5.134 to the U.S. Table in each of the WARC-92 bands. The international requirements for seasonal planning in the HFBC bands are described in Article 12 of the ITU *Radio Regulations*. See note 59, *supra*, which describes seasonal planning.

[100] 47 C.F.R. § 73.702(f), which is titled "Assignment and use of frequencies." Consequently, we are adding cross references to Radio Broadcast Services (HF) (Part 73) in the bands 7350-7400 kHz and 7400-7450 kHz.

[101] In the *Omnibus NPRM*, the exclusive worldwide HFBC allocations were listed in § 73.702(f)(1) and the exclusive Regional HFBC allocations were listed in § 73.702(f)(2)(i).

listed in paragraph (g)(2)).[102] Seventh, in order to recognize the co-primary status of the amateur service during the transition period and to provide guidance to HF broadcasters after March 27, 2005, new Section 73.702(g)(2)(i) will read as follows:[103]

> Until March 29, 2009, the band 7100-7200 kHz is allocated to the amateur and broadcasting services on a co-primary basis in Region 1 and Region 3; however, during this transition period, the use of the band 7100-7200 kHz by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. After March 27, 2005, where practical, requests for frequency assignments in the band 7100-7200 kHz shall be satisfied within the band 7200-7350 kHz. After March 29, 2009, the band 7100-7200 kHz is no longer allocated to the broadcasting service.

Eighth, we take note of continued co-primary fixed service use of the band 7350-7450 kHz in the 19 countries that are listed in international footnote 5.143C (most are in North Africa and the Middle East).[104] Ninth, we have consolidated the requirements for Regional operation in paragraph (h).[105] See Appendix A for the text of paragraphs (f), (g), and (h) of Section 73.702.

41. *The 40-Meter Band.* Absent any Commission action to the contrary, the Commission generally governs the operation of stations located in the U.S. Pacific insular areas in Region 3 consistent with the Region 3 Table.[106] Therefore, in accordance with the Region 3 Table, we are reallocating the band 7100-7200 kHz to the amateur service on a primary basis in the U.S. Pacific insular areas located in Region 3.[107] In accordance with international footnote 5.141C, the band 7100-7200 kHz remains allocated, until March 29, 2009, to the broadcasting service on a primary basis in the U.S. Pacific insular areas in Region 3. At the end of the WRC-03 transition period (*i.e.*, after March 29, 2009), the band 7100-7200 kHz is allocated exclusively to the amateur service in the U.S. Pacific insular areas in Region 3.

42. Based on comments of the ARRL, ASARA, and two licensees in the Amateur Radio Service, we are authorizing FCC-licensed amateur operators that are located within either Region 1 or Region 3 and that are outside an area where the amateur service is regulated by an authority other than the Commission to make immediate use of the band 7.1-7.2 MHz.[108] This action effectively increases the number of channels available worldwide to amateur stations and allows amateur stations to make more effective use of their frequency bands.[109] In order to implement this decision, we are amending Section

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[102] In the *Omnibus NPRM*, the co-primary worldwide HFBC allocations were listed in § 73.702(f)(3) and § 73.702(f)(4); and the co-primary Regional HFBC allocations were listed in § 73.702(f)(2)(i) and § 73.702(f)(ii).

[103] In the *Omnibus NPRM*, § 73.702(f)(2)(i) stated that, until March 29, 2009, the band 7100-7300 kHz is allocated on an exclusive basis to the broadcasting service in Region 1 and Region 3. This is incorrect. At WRC-03, the band 7100-7200 kHz was allocated to amateur service on a co-primary basis with the broadcasting service, effective January 1, 2005. After March 29, 2009, the band 7100-7200 kHz is allocated to the amateur service on an exclusive basis in much of the world.

[104] See Appendix A, § 73.702, paragraphs (g)(1)(ii) and (g)(2)(ii). Because the band 7350-7400 kHz is allocated to the HFBC and fixed services on a co-primary basis in the 19 countries listed in footnote 5.143C, HF broadcasters are required to protect fixed stations to which frequencies in the band 7350-7400 kHz have been already been assigned from harmful interference.

[105] In the *Omnibus NPRM*, the requirements for Regional operation were listed in § 73.702(f)(2)(i), (ii), and (iii).

[106] 47 C.F.R. § 2.105(a), note 4.

[107] For the list of U.S. Pacific insular areas in Region 3, see note 54, *supra.*

[108] Thus, in addition to the U.S. Pacific insular areas in Region 3, amateur operators licensed by the FCC are being authorized to operate onboard vessels and in aircraft that are within Region 1 or Region 3, but that are not within the territorial waters or airspace of another country. See note 12, *supra.*

[109] FCC-licensed amateur stations located in Region 2 presently exchange voice messages with amateur stations located in Region 1 and Region 3 by using two channels - one below 7100 kHz and one above 7150 kHz. By

(continued....)

97.301 of the Commission's Rules to add 7.1-7.2 MHz as an authorized frequency segment in Region 1 and Region 3.[110] Specifically, we are authorizing a station having a control operator who has been granted an operator license of Amateur Extra Class or Advanced Class to use all frequencies within the segment 7.0-7.2 MHz when operating in Region 1 or Region 3.[111] Consistent with their operating authority in Region 2, we are also authorizing a station having a control operator who has been granted an operator license of General Class, Novice Class, or Technician Class to use an additional 50 kilohertz when operating in Region 1 or Region 3 as follows. General Class licensees may operate within the segment 7.025-7.150 MHz[112] and Novice Class and Technician Class licensees may operate within the segments 7.050-7.075 MHz and 7.100-7.150 MHz.[113]

43. Currently, phone emissions may be transmitted in the segment 7.075-7.100 MHz by amateur stations located in Regions 1 and 3, and by amateur stations located within Region 2 that are west of 130° west longitude or south of 20° north latitude.[114] In this Report and Order, we are additionally authorizing those amateur stations that the Commission regulates in Region 1 and Region 3 with the same emission privileges for the band 7.100-7.200 MHz that we currently authorize for stations in Region 2.[115] We note that Brown requests that the frequency band for authorized phone emissions in the United States be expanded. We have previously proposed in a separate proceeding to expand the 40-meter phone band from 7.150-7.300 MHz to 7.125-7.300 MHz.[116] For this reason, we find that Brown's request is outside the scope of the instant proceeding.

44. With regards to FCC-licensed amateur stations communicating with amateurs in countries located in Region 1, we note that several member countries of the European Conference of Postal and Telecommunications Administrations (CEPT) have taken the intermediate step of either allocating the

(...continued from previous page)
allowing stations that we regulate in Region 1 and Region 3 immediate access to 7100-7200 kHz, communications between stations in Region 2 and U.S. Pacific insular areas in Region 3 can occur using only one channel.

[110] See Appendix A wherein Section 97.301 is revised.

[111] In Section 97.301, we are revising the entry for the 40-meter band in paragraphs (b) and (c) from 7.0-7.1 MHz and 7.025-7.100 MHz to 7.0-7.2 MHz and 7.025-7.200 MHz, respectively. We note that Amateur Extra Class and Advance Class licensees have access to the entire 40-meter band (7.1-7.3 MHz) when operating in Region 2. Thus, even after this action, Amateur Extra Class and Advance Class licensees that are operating in Region 1 or Region 3 will have access to less spectrum than they do when operating in Region 2. In addition, a control operator who holds a CEPT radio-amateur license Class 1 license or Class 1 IARP may use the segment 7.0-7.2 MHz when that operator is located in a U.S. Pacific insular area. 47 C.F.R. § 97.3(a)(12).

[112] In Section 97.301, we are revising the entry for the 40-meter band in paragraph (d) from 7.025-7.100 MHz to 7.025-7.150 MHz. We note that General Class licensees have access to the segments 7.025-7.150 MHz and 7.225-7.300 MHz in Region 2. Thus, our action makes all of the new spectrum that is in common with Region 2 (50 kilohertz) available to General Class licensees when they are operating in Region 1 or Region 3.

[113] In Section 97.301, we are revising the entry for the 40-meter band in paragraph (e) from 7.050-7.075 MHz to 7.050-7.075 MHz and 7.10-7.15 MHz. We note that Novice Class and Technician Class licensees have access only to the segment 7.10-7.15 MHz in Region 2. Thus, our action makes all spectrum that is in common with Region 2 (50 kilohertz) available to Novice Class and Technician Class licensees when they are operating in Region 1 or Region 3.

[114] 47 C.F.R. § 97.307(f)(11).

[115] That is, because we are adding the band 7.100-7.200 MHz to the Region 1 and Region 3 Tables in the appropriate paragraphs within Section 97.301, specific emission types for these frequencies are authorized by Section 97.305. Specifically, we are authorizing RTTY and data in the segment 7.100-7.150 MHz and phone and image emissions in the segment 7.150-7.200 MHz. *See* 47 C.F.R. § 97.305(c).

[116] Amendment of Part 97 of the Commission's Rules Governing the Amateur Radio Services, WT Docket No. 04-140, *Notice of Proposed Rulemaking*, 19 FCC Rcd 7293 at 7298, para. 8 (2004).

band 7100-7200 kHz to the amateur service on a secondary basis or making this spectrum available to the amateur service on a non-interference basis.[117] For example, in addition to non-interference operations in the CEPT member countries listed by ARRL in its comments (Croatia, San Marino, Norway, and Iceland), the band 7100-7200 kHz has recently been allocated to the amateur service on a secondary basis in the United Kingdom.[118]

45. We observe that the amateur and broadcasting services will share the band 7.1-7.2 MHz on a co-primary basis for about four years. In this regard, we want to make clear that the seasonal schedule for international broadcasting constitutes "first in" and thus, amateur operators are expected to keep themselves apprised of the changing seasonal schedules and to avoid transmissions that are likely to interfere with the reception of international broadcast programs.[119] In addition, we are concerned about blanketing interference and note that, in areas where homes are packed closely together, an amateur station could disrupt several listeners' reception of international broadcast programming. Therefore, at the request of the BBG, we will make explicit our expectation that amateur operators are to eliminate any interference problem that they cause while transmitting in the band 7.1-7.2 MHz.[120] We believe that this action is necessary because of the novel co-primary sharing situation that will go on for approximately four years. Accordingly, we are adopting a new United States footnote, which will read as follows:

> US395 Until March 29, 2009, the use of the band 7100-7200 kHz in Region 1 and Region 3 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3.

46. *The WARC-92 HFBC Bands.* In the *Below 28 MHz Report and Order*, the Commission adopted footnote US366 and stated that it would cease to issue licenses for new non-Federal stations in the fixed and mobile services in the WARC-92 HFBC bands on April 1, 2007.[121] We observe that the implementation date for the WARC-92 HFBC bands (April 1, 2007)[122] lags behind the start of the "A07" schedule for international broadcasting (March 25, 2007)[123] by one week. Because a significant number of international broadcast stations are currently operating in frequency bands not allocated to the broadcasting service, we conclude that it is highly likely that international broadcasters will attempt to use

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[117] The 46 member nations of CEPT have adopted the Harmonized European Table of Frequency Allocations and Utilizations. While implementation of this Table has been arranged for 2008, it is expected that CEPT member countries will endeavor to implement, as soon as possible, as many parts of the Table as they are able. The European Common Allocation for the band 7100-7200 kHz shows that this spectrum is allocated to the amateur and broadcasting services on a co-primary basis until March 29, 2009, at which time this spectrum will be allocated exclusively to the amateur service. *See* European Table of Frequency Allocations and Utilizations Covering the Frequency Range 9 kHz to 275 GHz, Lisboa January 2002 - Dublin 2003 - Turkey 2004 - Copenhagen 2004, ERC Report 25 at http://www.ero.dk.

[118] *See* http://www.ofcom.org.uk/licensing_numbering/radiocomms/ukfat/?a=87101.

[119] The seasonal schedule for international broadcasting can be obtained from various sources. For example, the operational schedule can be downloaded free of charge at: http://www.hfcc.org. We note, however, that while the High Frequency Co-ordination Conference (HFCC) coordinates the transmission schedules of about 60 organizations from more than 30 countries, this represent only about 75 to 80 percent of the global HFBC output.

[120] We note that the Commission's Rules already state that no amateur operator shall willfully or maliciously interfere with or cause interference to any radio communication or signal. 47 C.F.R. § 97.101(d).

[121] *Below 28 MHz Report and Order*, 18 FCC Rcd at 3429, paras. 13-14. See note 47, *supra*, for the text of footnote US366.

[122] 47 C.F.R. § 2.106, footnotes 5.136, 5.143, 5.146, 5.151, and US366.

[123] ITU Radio Regulations Nos. 12.17, 12.18, and 12.19 divide the year into two seasonal periods:
Schedule A: Last Sunday in March to last Sunday in October.
Schedule B: Last Sunday in October to last Sunday in March.

the WARC-92 HFBC bands more intensely beginning on March 25, 2007 (not April 1, 2007). We observe that the *WARC-92 Final Acts* provided incumbent licensees in the fixed and mobile services a 15 year transition period (April 1, 1992 to April 1, 2007) during which these licensees could have relocated their operations to other frequency bands. Moreover, except in Alaska and the U.S. Pacific insular areas, the Commission does not seek international protection for assignments to stations in the fixed and land mobile services that operate in frequency bands below 25 MHz, and thus, the Commission will not accept responsibility for the protection of these circuits from harmful interference caused by foreign operations.[124] Because of its concern for potential harmful interference to these unprotected circuits, the Commission has long required that equipment in the fixed and land mobile services operating in the frequency bands below 25 MHz to be tunable. Thus, the 219 licenses authorized under Section 90.266 that currently operate in a WARC-92 HFBC band will be able to operate outside the reallocated spectrum with minimal effort.[125] We find that advancing the implementation date for the WARC-92 HFBC bands by one week is prudent, in the public interest, and of a *de minimus* nature.[126] Because the allocation change does not take effect until 2007, fixed and mobile licensees that are still operating in the WARC-92 HFBC bands now have advance notice of this situation. Accordingly, we are revising footnote US366 and our licensing policy to align the implementation date for the WARC-92 HFBC bands in the United States with the start of the A07 seasonal schedule.

47. BBG recommends that we delete unused fixed and mobile allocations from the non-Federal Table in the WARC-92 HFBC bands. Our licensing records show that there are no non-Federal licensees authorized to operate stations in the: (1) aeronautical mobile service in two of the WARC-92 HFBC bands (5900-5950 kHz and 7300-7350 kHz) and in the WRC-03 HFBC band (7350-7400 kHz);[127] and (2) fixed service in three of the WARC-92 HFBC bands (13570-13600 kHz, 17480-17550 kHz, and 18900-19020 kHz).[128] We believe that it is prudent to delete these unused allocations. Accordingly, we are deleting these unused allocations from the non-Federal Table and from footnote US366.

48. We are moving the transition plan for the band 7300-7350 kHz, which is currently shown in footnote US366, to a new United States footnote that is discussed in the paragraph 51, below. Finally, our review finds that footnote US366 inadvertently expands the mobile service allocations in the WARC-92 HFBC bands and we are therefore correcting this error.[129] Taking all these factors into account, we are revising footnote US366 to read as follows:

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[124] 47 C.F.R. § 2.102(h)(3).

[125] We have concluded that the effect of the reallocations will be minimal. For example, the equipment is required to be tunable, so the licensees can easily use other bands; in practice, licensees are licensed for the entire band (*e.g.*, 7300-8100 MHz) rather than for specific frequencies, so they do not need to modify their license in order to use frequencies in the remainder of their licensed band; and the licensees tend to be licensed on more than one frequency band for use under Section 90.266. See para. 25, *supra*.

[126] Moreover, given the one-week time period, it is likely that any interference would not be identified or remedied before remaining fixed and mobile licensees had become secondary in the band.

[127] The bands 5900-5950 kHz and 7300-7400 kHz are allocated to the mobile except aeronautical mobile (R) service and the mobile service, respectively. However, because the bands 5900-5950 kHz and 7300-7400 kHz are not listed in the frequency table for the aviation services (47 C.F.R. § 87.173(b)), these bands are not currently available for use by the non-Federal aeronautical mobile service. In addition, NTIA has informed us that the Federal aeronautical mobile service allocations in the bands 5900-5950 kHz, 7300-7400 kHz, 13570-13600 kHz, and 13800-13870 kHz are unused and that these allocations are to be deleted from the Federal Table. Accordingly, we are amending the Federal Table and adopting new United States footnote US396 that reflects NTIA's decision. See para. 51, *infra*.

[128] See Table 2, *supra*, for the number of licenses that the Commission has issued for fixed and mobile operations in each of the WARC-92 HFBC bands.

[129] Currently, there are mobile service allocations in only three of the ten WARC-92 HFBC bands. Specifically, the band 5900-5950 kHz is allocated to mobile except aeronautical mobile (R) service on a primary basis for Federal (continued....)

US366 On March 25, 2007, the bands 5900-5950 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13570-13600 kHz, 13800-13870 kHz, 15600-15800 kHz, 17480-17550 kHz, and 18900-19020 are allocated exclusively to the broadcasting service.

(a) As of March 25, 2007, authority to operate new Federal stations in the fixed service may be extended in all of the above listed frequency bands and authority to operate new Federal stations in the mobile except aeronautical mobile service may be extended in the bands 5900-5950 kHz, 13570-13600 kHz, and 13800-13870 kHz. As of March 25, 2007, all Federal stations shall: (1) be limited to communications only within the United States and its insular areas; (2) not cause harmful interference to the broadcasting service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU *Radio Regulations*.

(b) As of March 25, 2007, authority to operate new non-Federal stations in the fixed and mobile except aeronautical mobile services shall not be extended in any of the above listed frequency bands. As of March 25, 2007, non-Federal stations in the: (1) fixed service may continue to use the bands 5900-5950 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13800-13870 kHz, and 15600-15800 kHz; and (2) mobile except aeronautical mobile service may continue to use the band 5900-5950 kHz. As of March 25, 2007, non-Federal stations shall: (1) be limited to communications only within the United States and its insular areas; (2) not cause harmful interference to the broadcasting service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU *Radio Regulations*.

49. As of our most recent review (March 5, 2005), the Commission has issued 249 licenses for the authority to operate stations in the fixed or mobile services in spectrum that has been reallocated internationally to the HFBC service.[130] We anticipate that a significant number of international broadcast stations, which currently are operating in bands not allocated to the broadcasting service (out-of-band operations), will relocate to the WARC-92 HFBC bands beginning March 25, 2007, and to the band 7350-7400 kHz beginning March 29, 2009. We recommend that licensees in the fixed and mobile except aeronautical mobile services carefully evaluate whether their operations can coexist with these high-powered stations without causing interference to the reception of international broadcast programming.[131] In this regard, we remind non-Federal licensees in the fixed and mobile except aeronautical mobile services that, as of March 25, 2007 for the WARC-92 HFBC bands and as of March 29, 2009 for the band 7350-7400 kHz, their operation is subject to immediate termination if the Commission determines that their operation is causing interference to the broadcasting service.

50. *WRC-03's Impact on the Fixed and Mobile Services.* Consistent with the WRC-03's transition plan for the band 7350-7400 kHz, we are moving the existing primary fixed and secondary mobile service allocations in the band 7350-7400 kHz, which are listed directly in the U.S. Table, to new United States footnote US396, below; and we are maintaining the current allocation status of the fixed and mobile services in this band until the end of the WRC-03 HFBC transition period (March 29, 2009).[132] Thereafter, stations in the fixed and mobile services will operate on an unprotected, non-interference basis to the HFBC service. Because the aeronautical mobile service portion of the

(...continued from previous page)
and non-Federal use and the bands 13570-13600 MHz and 13800-13870 kHz are allocated to the mobile except aeronautical mobile (R) service on a secondary basis for Federal use.

[130] This total excludes the 18 Alaska private-fixed stations that will be protected.

[131] We observe that some international broadcast stations transmit with a rated carrier power of 500 kW and that many (if not most) use 100 kW. We note that the minimum power that the Commission authorizes is 50 kW.

[132] Because the band 7350-7400 kHz is allocated to the mobile service in the United States (rather than the more limited land mobile service), we are adding a new footnote to the U.S. Table that maintains the broader mobile except aeronautical mobile service allocation until the end of the transition period (March 29, 2009), and that otherwise parallels international footnote 5.143D.

mobile service allocation is unused, we will limit mobile service use to the mobile except aeronautical mobile service.[133]

51. The Commission has previously reallocated the band 7300-7350 MHz (a WARC-92 HFBC band) to the broadcasting service on a co-primary basis with the fixed service until April 1, 2007, at which time this 50 kilohertz is allocated exclusively for HFBC use.[134] Because the only difference between the reallocation of the band 7300-7350 kHz and the band 7350-7400 kHz is the transition period, we conclude that the reallocation of the band 7300-7400 kHz to the broadcasting service should be shown in a consistent manner. Therefore, we are moving the transition plan for the band 7300-7350 kHz from footnote US366 to new United States footnote US396, which will contain our transition plans for both the band 7300-7350 MHz and the band 7350-7400 kHz. In addition, we will cease the licensing of new non-Federal stations in the fixed and mobile services in the band 7350-7400 kHz on March 29, 2009.

52. With regard to incumbent stations in the fixed or mobile services in the band 7350-7400 kHz, it is not necessary to make special provision for the licensees in the Industrial/Business Radio Pool because most (101 of 102 licenses) are required to operate equipment that is tunable throughout the bands specified for long distance communications. We also decline to make special provision for the three coast stations that are licensed to operate in the band 7350-7400 kHz because these stations can continue to operate on their licensed frequencies on a non-interference, unprotected basis to the HFBC service[135] or these coast station licensees can move their operations to other frequency bands that are allocated to the fixed or mobile services.[136] Our staff has reviewed the current seasonal schedule for the HFBC service. Because of the extremely light use of HFBC spectrum targeting Alaska, we conclude that it is not necessary to place further burdens on the Alaska private-fixed stations, and therefore, will not reallocate the 2.8 kilohertz of spectrum used by these 18 licensees (the sub-band 7368.5-7371.3 kHz).[137] Accordingly, we are adopting new United States footnote US396, which reads as follows:

> US396 The band 7300-7400 kHz is allocated exclusively to the broadcasting service in accordance with the schedule specified below, except that the sub-band 7368.5-7371.3 kHz is allocated to the fixed service on an exclusive basis for non-Federal use within the State of Alaska in accordance with 47 C.F.R. § 80.387.
>
> (a) Until March 25, 2007, the band 7300-7350 kHz is allocated to the fixed service on a primary basis and to the mobile except aeronautical mobile service on a secondary basis for Federal and non-Federal use. After March 25, 2007, authority to operate in the band 7300-7350 kHz shall not be extended to new non-Federal stations in the fixed and mobile except aeronautical mobile services. After March 25, 2007,

[133] See para. 47, *supra*, concerning the deletion of the unused aeronautical mobile service allocation in the band 7350-7400 MHz.

[134] In the WARC-92 HFBC bands, the Commission added an entry for the broadcasting service to the U.S. Table, continued to display the entries for incumbent fixed and mobile services in the U.S. Table, and implemented the exclusive broadcasting allocation in footnote US366. We are not displaying the entries for the primary fixed and secondary mobile services in the band 7300-7400 MHz in the U.S. Table. Therefore, the band 7300-7350 kHz has been removed from footnote US366 and it has been added to footnote US396.

[135] That is, these coast station licensees must keep themselves apprised of the HFBC seasonal schedule so that they do not operate on a channel that would cause harmful interference to HFBC programming. These coast station licenses are discussed in para. 27, *supra*.

[136] For example, Section 80.371(b) lists the working frequencies in the frequency range from 4 kHz to 27.5 MHz that are available to public coast stations. See Section 80.373 for private communication frequencies. 47 C.F.R. §§ 80.371(b), 80.373.

[137] It has long been Commission policy to recognize Alaska's unique radiocommunication needs in our Rules. For example, Section 2.102(h) contains the special provisions regarding the use of spectrum allocated to the fixed and land mobile services below 25 MHz. In particular, Section 2.102(h)(1)(ii)(D) states that one of the limited circumstances in which fixed stations may be granted authority to operate on frequencies below 25 MHz is for the provision of communication circuits wholly within the State of Alaska. See para. 26, *supra.*

> Federal and non-Federal stations in the fixed and mobile except aeronautical mobile services shall: (1) be limited to communications wholly within the United States and its insular areas; (2) not cause harmful interference to the broadcasting service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU *Radio Regulations*.
>
> (b) Until March 29, 2009, the band 7350-7400 kHz is allocated to the fixed service on a primary basis and to the mobile except aeronautical mobile service on a secondary basis for Federal and non-Federal use. After March 29, 2009, authority to operate in the band 7350-7400 kHz shall not be extended to new non-Federal stations in the fixed and mobile except aeronautical mobile services. After March 29, 2009, Federal and non-Federal stations in the fixed and mobile except aeronautical mobile services shall: (1) be limited to communications wholly within the United States and its insular areas; (2) not cause harmful interference to the broadcasting service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU *Radio Regulations*.

53. As stated above, it is longstanding Commission policy that, absent any Commission action to the contrary, the operation of stations located in the U.S. Pacific insular areas in Region 3 are governed by the Region 3 Table.[138] Therefore, in accordance with the Region 3 Table, the band 7350-7450 kHz is reallocated to the broadcasting service on a primary basis in the U.S. Pacific insular areas located in Region 3. In accordance with international footnote 5.143A, the band 7350-7450 kHz remains allocated, until March 29, 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis in the U.S. Pacific insular areas in Region 3.[139] At the end of the WRC-03 transition period (*i.e.*, after March 29, 2009), the band 7350-7450 kHz is allocated exclusively to the broadcasting service in the U.S. Pacific insular areas in Region 3.

54. In order to highlight the WARC-92 and WRC-03 transition plans in Part 90 of the Commission's Rules, we are adding new limitation (88) to the frequency range 2000 to 10,000 kHz in the Public Safety Pool Frequency Table, which will read as follows:[140]

> (88) As of March 25, 2007, the FCC will cease to issue licenses for new stations in the fixed and mobile services in the following bands: 5900-5950 kHz, 7300-7350 kHz and 9400-9500 kHz. As of March 29, 2009, the FCC will cease to issue licenses for new stations in the fixed and mobile services in the band 7350-7400 kHz and, in the U.S. Pacific insular areas in Region 3, the band 7400-7450 kHz. Stations licensed as of March 25, 2007 in the bands 5900-5950 kHz, 7300-7350 kHz and 9400-9500 kHz and as of March 29, 2009 for the band 7350-7400 kHz in Region 2 and the band 7350-7450 kHz in Region 3 shall: (1) be limited to communications only within the United States and its insular areas; (2) not cause harmful interference to the broadcasting service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU *Radio Regulations*.

55. Likewise, in order to highlight the WARC-92 and WRC-03 transition plans in Industrial/Business Pool Frequency Table in Part 90 of the Commission's Rules, we are adding new limitation (90) to the frequency range 2000 to 25,000 kHz, which will read as follows:[141]

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[138] 47 C.F.R. § 2.105(a), note 4.

[139] The staff conducted a geographic license search for Guam, the Northern Mariana Islands, and American Samoa, which are the only Region 3 insular areas that are listed in the ULS. In these insular areas, the only license in the ULS for the band 7350-7450 kHz is call sign WNJP931, which authorizes the use of 7409.5 kHz at two locations on Saipan (Northern Marianas College and Marianas High School).

[140] See Appendix A wherein § 90.20(c)(3) is revised by adding a reference to limitation (88) and new paragraph (d)(88) is added to § 90.20 in order to list new limitation (88).

[141] See Appendix A wherein § 90.35(b)(3) is revised by adding a reference to limitation (90) and new paragraph (c)(90) is added to § 90.35 is added in order to list new limitation (90).

(90) As of March 25, 2007, the FCC will cease to issue licenses for new stations in the fixed and mobile services in the following bands: 5900-5950 kHz, 7300-7350 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13800-13870 kHz, and 15600-15800 kHz. As of March 29, 2009, the FCC will cease to issue licenses for new stations in the fixed and mobile services in the band 7350-7400 kHz and, in the U.S. Pacific insular areas in Region 3, the band 7400-7450 kHz. Stations licensed as of March 25, 2007 in the bands 5900-5950 kHz, 7300-7350 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13800-13870 kHz, and 15600-15800 kHz and as of March 29, 2009 for the band 7350-7400 kHz in Region 2 and the band 7350-7450 kHz in Region 3 shall: (1) be limited to communications only within the United States and its insular areas; (2) not cause harmful interference to the broadcasting service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU *Radio Regulations*.

56. Consistent with the *WRC-03 Final Acts*, we are allocating the bands 6765-7000 kHz and 7400-8100 kHz to the mobile except aeronautical mobile (R) service on a primary basis for Federal and non-Federal use.[142] This action grants licensees increased flexibility and is expected to facilitate adaptive techniques, which together with automation techniques, can reduce the burden on the operator while making these mobile service radios more responsive to changing HF propagation conditions.

57. We are adopting WRC-03's phased-in approach for the allocation upgrade in the band 6765-7000 kHz. However, because this spectrum is allocated to the mobile service in the United States (rather than the more limited land mobile service), we are adding a new footnote to the U.S. Table that maintains this secondary mobile service allocation until the end of the transition period, and that otherwise parallels international footnote 5.138A. Accordingly, we adopt footnote US394, which reads as follows:

US394 Until 29 March 2009, the band 6765-7000 kHz is allocated to the fixed service on a primary basis and to the mobile service on a secondary basis. After this date, this band is allocated to the fixed and the mobile except aeronautical mobile (R) services on a primary basis.

58. We are allocating the band 7400-8100 kHz (7450-8100 kHz in the U.S. Pacific insular areas in Region 3) to the mobile except aeronautical mobile (R) service on a primary basis for Federal and non-Federal use and, at the request of NTIA, we are making this allocation upgrade effective as of the effective date of this Report and Order, in lieu of WRC-03's phased-in approach. Doing so will allow for primary mobile use of this band approximately four years earlier than under the phased-in approach. We received no comments opposing this action.

B. Service Rule Amendments for International Broadcast Stations

59. ***Background.*** WRC-03 required that HFBC transmitting stations meet the system specifications contained in Appendix 11 of the ITU *Radio Regulations*.[143] Appendix 11 describes the system specifications for DSB, SSB, and digitally modulated emissions in the HFBC bands. In general, Appendix 11 establishes minimum technical standards that enhance spectrum sharing. We noted, however, that the Commission's Rules for international broadcast stations currently do not provide for SSB or digital operations nor do our Rules for DSB operations mirror the Appendix 11 requirements.

60. WRC-03 resolved that whenever an administration replaces a DSB emission with an emission using digital or SSB modulation techniques, it should ensure that the level of interference is not

[142] Currently, the bands 6765-7000 kHz and 7400-8100 kHz are allocated to the fixed service on a primary basis and to the mobile service on a secondary basis for Federal and non-Federal use. We are upgrading the allocation status of the mobile service from secondary to primary and, consistent with the worldwide allocation, we are prohibiting the use of this spectrum by the aeronautical mobile (R) service.

[143] *See WRC-03 Final Acts*, Article 23, No. 23.12.

greater than that caused by the original DSB emission.[144] WRC-03 also invited administrations to encourage the inclusion of digital modulation capability in all new HFBC transmitters put into service after January 1, 2004.[145]

61. Currently, Section 73.751 of the Commission's Rules states that no international broadcast station will be authorized to install, or be licensed for operation of, transmitter equipment with a rated carrier power of less than 50 kW.[146] The technical basis of this rule is that, given frequency congestion, an international broadcast station using DSB modulation needs to transmit with an output power of at least 50 kW in order to provide a signal that is strong enough to be received with low cost HFBC radios. We have previously waived this Rule in order to authorize licensees to operate SSB transmitters with 50 kW PEP because this power provides approximately the same coverage area (even though this power is equivalent to only 15-20 kW relative to a DSB transmitter). Likewise, one of the advantages of digital transmission is that a lower rated transmitter output power can serve the same geographic area as a higher power analog signal. Staff research indicated that a mean power of 20 kW for digital transmissions would provide approximately the same coverage as the minimum power for DSB transmissions currently provides.

62. *Proposal.* We proposed to update the Commission's Rules for international broadcast stations so that SSB and digital operations can be authorized without the need for a waiver of the rules and so that DSB requirements would match those of the ITU *Radio Regulations*. Specifically, we proposed to add the ITU's RF requirements for DSB, SSB, and digital HFBC systems, which are listed in Appendix 11 of the ITU *Radio Regulations*, to the Commission's Rules so that there would be no ambiguity regarding the rules with which HF broadcasters must comply.[147]

63. We stated that, in conjunction with the adoption of revised international footnote 5.134, the effect of these proposals would be to grant U.S.-licensed international broadcast stations the flexibility to continue to transmit analog DSB signals or to transmit SSB or digital signals, including DRM signals (currently the only ITU-recommended digital standard for use in HFBC bands), which would allow international broadcast stations to provide FM-like sound quality to listeners in foreign countries. Nonetheless, we requested comment on whether the DRM standard should be required for digital transmissions.[148] We observed that the ITU had recently approved the use of the DRM standard for broadcasting use in frequency bands below 30 MHz;[149] that some international broadcasters have begun DRM transmissions; and that broadcasting, unlike many other radiocommunication services, is a mass media service and that for such a service, standards are often useful.[150]

64. We proposed to revise Section 73.751 to codify to 50 kW PEP and 20 kW mean power as the minimum operating powers for SSB and digital systems, respectively.[151] We requested comment on whether digital modulation capability should be required in all new HFBC transmitters.

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[144] *See WRC-03 Final Acts*, Resolution 517 (Rev.WRC-03), *resolves* 3.

[145] *See WRC-03 Final Acts*, Resolution 517.

[146] 47 C.F.R. § 73.751 (Operating power).

[147] *Omnibus NPRM*, 19 FCC Rcd at 6600, para. 18.

[148] *Id* at para. 19.

[149] *See* Draft New Recommendation ITU-R BS.[Doc.6/379], document 6/BL/3-E, dated August 21, 2003. The DRM standard is more precisely IEC Standard 62272-1, which is available in electronic form at ITU website: http://www.itu.int/md/choice_md.asp?id=R00-WP6E-C-0284!P1!ZIP-E&lang=e&type=sitems.

[150] *Omnibus NPRM*, 19 FCC Rcd at 6600, para. 19.

[151] *Id* at para. 20.

65. *Comments*. NASB states that it agrees with all of the proposals relating to HF broadcasting, except for the minimum power level for digital transmissions.[152] Specifically, NASB agrees with the system specifications for DSB, SSB, and digital transmissions as indicated in the proposed revision of Section 73.756. NASB does not agree that a mean power of 20 kW for digital transmissions is necessary in order to provide approximately the same coverage as a 50-kW analog transmission.[153] Instead, NASB requests that the Commission adopt a lower minimum power level.[154] NASB emphasizes that in order for digital transmissions to co-exist along with DSB and SSB transmissions in the same frequency bands without undue interference, it will be necessary for the power of the digital transmissions to be several dB lower than that which is currently used for DSB and SSB emissions, *i.e.*, specifically a minimum of 7 dB lower. Accordingly, NASB recommends that the Commission adopt 10 kW as the minimum mean power for digital HFBC transmissions.[155]

66. NASB "believes that the DRM standard should be the required standard for digital transmissions" and states that it is unwise and unnecessary to require inclusion of the capability to offer digital in all new HFBC transmitters because manufacturers already are building in provisions for digital modulation.[156]

67. NASB supports the authorization of SSB and digital transmissions in the HF broadcasting service bands, agrees that U.S.-licensed international broadcast stations should have the flexibility to transmit analog DSB signals, SSB signals or digital signals in all of the frequency ranges allocated to the service, and agrees that SSB transmissions should be authorized with a minimum 50 kW of PEP, because this provides approximately the same coverage area as a 50-kW carrier power for an analog DSB HF transmission.[157]

68. Leggett states that SSB transmissions are generally more efficient than DSB transmissions, and thus, the Commission can authorize a lower minimum power for SSB transmissions.[158] However, Leggett states that the power level selected should be such that the SSB signal would at least be equivalent to a DSB signal over the same signal path from transmitter to listener. Leggett recommends that HFBC broadcasters be allowed to use digital broadcasting technology if they judge that it will be useful, but states that HFBC broadcasters should not be required to purchase transmitters that are digital-capable. Accordingly, Leggett proposes that the Commission should "leave it to the World marketplace to decide when or if international digital broadcasting is a suitable mode."[159]

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[152] *See* NASB Comments at 3.

[153] NASB asserts that numerous authorities, including the DRM Consortium, have indicated that DRM transmissions should be at least 7 dB below the equivalent analog power. In particular, NASB cites the Broadcasters' User Manual, which published by the Digital Radio Mondiale (DRM) Consortium, first edition, March 2004, page 47, at chapter 6.4: "Under current coordination procedures, [HF] DRM transmissions may be introduced under similar principles to that in the MW bands. That is the service is first coordinated as if it were an analogue DSB service and then a DRM transmission substituted with a power level at least 7 dB lower than the allowable analogue transmission." NASB states that 7 dB down from 50 kW would be 9.976 kW (nominally 10 kW), so NASB believes that the minimum power for DRM transmissions should be 10 kW. NASB Comments at 2. In its comments, NASB uses the term average power (not mean power); see note 8, ***supra.***

[154] The Commission's Rules normally limit transmitters to a maximum power, but in the case of the HFBC service, there is no maximum power limit and instead our Rules limit transmitters to a minimum power. See para. 61, ***supra.***

[155] *See* NASB Comments at 2.

[156] *Id*. at 3.

[157] *Id* at 2.

[158] *See* Leggett Comments at 5.

[159] *Id* at 4.

69. BBG supports the HFBC proposals that we made in the *Omnibus NPRM* and NASB's request that we adopt the DRM standard as a requirement for digital HFBC transmission.[160] In this regard, BBG observes that DRM is the only internationally approved standard for digital HFBC transmission and that no other standard is being considered at this time. BBG states that, if the Commission were to adopt the DRM standard, it believes that the digital HFBC transition will be shortened.

70. BBG recommends that the Commission adopt 10 kW mean power as the minimum power level for digital HFBC, and fully supports the views of the NASB in this regard.[161] BBG states that it has extensive testing experience utilizing DRM, and this testing validates the 7 dB provisional planning criteria regarding DRM versus analog DSB transmission. Further, as a DRM consortium member, and using its Morocco transmitting station, BBG provided demonstrations of digital HFBC to the attendees of WRC-03 in Geneva. BBG states that these very successful demonstrations used power levels of 10 kW.

71. BBG recommends that the Commission adopt 50 kW as the minimum peak envelope power for SSB emissions because this power level provides approximately the same coverage area as a DSB signal with 50 kW of carrier power.[162]

72. *Decision.* We are revising the Commission's HFBC service rules to authorize SSB and digital transmissions in the HF bands between 5900 kHz and 26100 kHz that are allocated to the broadcasting service. This action updates the Commission's HFBC rules so that they mirror Appendix 11 of the ITU *Radio Regulations*, which was recently revised at WRC-03. As a result, FCC-licensed international broadcast stations now have the flexibility to continue to transmit DSB signals or to transmit SSB or digital signals. The RF system specifications are shown in Appendix A at Section 73.756 (DSB), Section 73.757 (SSB), and Section 73.758 (digital).

73. We are adopting the DRM standard for digital transmissions in the HFBC bands.[163] We observe that DRM is the world's only non-proprietary,[164] digital system for international broadcasting.[165]

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[160] As part of the IRAC coordination process, BBG reviewed the draft Report and Order and provides the following comments. BBG believes that the reorganization of the rule section dealing with the assignment and use of frequencies (Section 73.702) is clearer than that originally proposed in the *Omnibus NPRM* and that the revised rules also correct several errors that became apparent because of the reorganization. Specifically, BBG states that the Commission's revised rules correctly interpret the WRC reallocation decisions and provide a clear and simple means of understanding how the new rules apply. BBG states that this especially applies to the revised rules where the distinction between exclusive allocations (Section 73.702(f)) and co-primary allocations (Section 73.702(g)) are described, and how transitional timeframes (Section 73.702(g)) and Regional requirements (Section 73.702(h)) apply. Along with NASB, BBG strongly supports the proposed system specifications and notes that they are consistent with Appendix 11 of the ITU *Radio Regulations*. BBG also believes that the revised rules are clearer in that the system requirements for DSB, SSB, and digitally modulated emissions have been placed in separate sections (Sections 73.756, 73.757, and 73.758). *See* BBG Letter at 1.

[161] *See* BBG Letter at 2.

[162] *Id.*

[163] The DRM homepage is at http://www.drm.org/. The U.S. members of DRM are Dolby Laboratories Inc; DRS Broadcast Technology; Harris Broadcast; International Broadcasting Bureau (BBG); Kintronic Laboratories Inc; Sangean America, Inc.; TCI International, Inc; and Texas Instruments. The U.S. associate members of DRM are Dolby Laboratories Licensing Corp.; NASB; and Via Licensing Corp.

[164] Section 4.6.3 of the DRM Broadcaster's User Manual describes Ownership and Protection of DRM Intellectual Property (IP) as follows: "Both DRM Members and non-members own DRM essential patents. DRM required all members holding essential IP to use reasonable endeavors to form a patent-pool. The DRM patent pools (one relating to MPEG 4 audio, and one for everything else) were formed in 2003. Each patent pool in turn is charged with agreeing and putting in place a licensing regime for the exploration of the patents on fair, reasonable and non-discriminatory terms. In practice, the licensing of DRM IP is undertaken by a Licensing Administrator acting (continued....)

WRC-03 gave approval for DRM use in all the HFBC bands; there are no band restrictions on the use on the use of DRM.[166] Currently, seven international broadcasters are transmitting DRM signals to all or part of the 48 contiguous states.[167] We also observe that there is a datacasting standard for DRM, which will permit FCC-licensed international broadcasters to offer wide-area datacasting as well as high quality audio broadcasting.[168] Other benefits of DRM include: (1) improved audio quality that is near-FM quality sound; (2) many existing DSB transmitters can be easily modified to carry DRM signals; (3) the robustness of the DRM signal can be chosen to match different propagation conditions; and (4) uses the same frequencies and bandwidth as DSB, which simplifies coordination.[169]

74. We are revising Section 73.751 of the Commission's Rules to state that no international broadcast station will be authorized to install, or be licensed for operation of, transmitter equipment with a peak envelope power of less than 50 kW if SSB modulation is used. This action is consistent with Leggett's request that the minimum power level for SSB transmissions be such that the SSB signal would at least be equivalent to a DSB signal over the same signal path from transmitter to listener. In this regard, we note that the International Bureau has previously waived Section 73.751 in order to authorize HFBC licensees to operate SSB transmitters at 50 kW PEP because this power provides approximately the same coverage area as a DSB transmitter with a rated carrier power of 50 kW (even though this power is equivalent to only 15-20 kW relative to a DSB transmitter).

75. We are revising Section 73.751 of the Commission's Rules to state that no international broadcast station will be authorized to install, or be licensed for operation of, transmitter equipment with a mean power of less than 10 kW if digital modulation is used. We take this action at the request of NASB and BBG. In making this decision, our engineering staff has reviewed the DRM Broadcasters' User Manual.[170] The key statement is paraphrased below:

> Under current coordination procedures, DRM transmissions are first coordinated as if the service were an analog DSB service and then a DRM transmission is substituted with a power level at least 7 dB lower than the allowable analog transmission.[171]

Our engineering staff had originally recommended a minimum mean power of 20 kW. However, we observe that, using its Morocco transmitting station, "BBG provided demonstrations of digital HFBC to

(...continued from previous page)
on behalf of the patent pool: for DRM this function is currently being undertaken by VIA Licensing; see www.vialicensing.com."

[165] In May 2003, the European Telecommunications Standards Institute (ETSI) elevated its September 2001 Technical Specification of the DRM system to a higher level, ETSI Standard. The new document is published as ETSI ES 201 980 V1.2.2 (2003-4), Digital Radio Mondiale (DRM); System Specification. This document is available as a free download from: http://pda.etsi.org/PDA/home.asp?wki_id=E,Mk8LSXqO56EDEBYqe9j.

[166] Any scheduled DRM circuit will be coordinated in accordance with Article 12 of the ITU *Radio Regulations* in the same way as for any proposed analog circuit. *See* DRM Broadcasters' User Manual at Section 3.4.1 (Regulatory Issues).

[167] These international broadcasters are: BBC World Service, Ministry of Information-State of Kuwait, Radio Canada International, Radio Nederland Wereldomroep (Radio Netherlands), Radio Sweden International, TDP Radio, and Vatican Radio. This information came from the previous seasonal schedule (A04) for DRM transmission, which is at: http://www.hfcc.org/data/A04drm.html.

[168] In May 2003, ETSI published the datacasting standard for DRM as ETSI TS 101 968 V1.1.1 (2003-04), Digital Radio Mondiale (DRM); Data applications directory.

[169] The technical aspects of the DRM on-air system are described at http://www.drm.org/system/globtechnical.htm.

[170] The DRM Broadcasters' User Manual is available as a free download from: http://www.drm.org/BUM/globbum.htm.

[171] *See* DRM Broadcasters' User Manual at Section 6.4 (Regions 1, 2, and 3 – SW/HF Bands).

the attendees of WRC-03 in Geneva. These very successful demonstrations used power levels of 10 kW."[172] After considering these new facts and also recognizing that some international broadcast stations use rhombic antennas that can provide 10-15 dB of gain, we are persuaded to adopt the minimum mean power level that NASB requests.[173]

76. Finally, we agree with NASB and Leggett that it is unnecessary to require that new HFBC transmitters have a digital modulation capability at this time because manufacturers are already building in provisions for digital modulation.

C. SRS and EESS Downlinks at 25.5-27 GHz and ISS at 25.25-27.5 GHz

77. *Background*. The band 25.25-27.5 GHz is allocated to the fixed and mobile services and to the ISS on a co-primary basis throughout the world.[174] ISS use of the 25.25-27.5 GHz band is limited by international footnote 5.536 to SRS and EESS applications and to transmissions of data originating from industrial and medical activities in space.[175] Further, the band 25.5-27 GHz is allocated to the EESS (space-to-Earth) on a primary basis throughout the world. International footnote 5.536A states that administrations installing EESS earth stations cannot claim protection from stations in the fixed and mobile services operated by neighboring administrations.[176]

78. In the United States, the band 25.5-27 GHz is Federal/non-Federal shared spectrum that is primarily used by Federal agencies and the international allocations described above have been implemented in the Federal Table.[177] The National Aeronautics and Space Administration (NASA) has three geostationary Tracking and Data Relay Satellite System (TDRSS) space stations in orbit that currently have the capability to receive transmissions in the band 25.25-27 GHz from low Earth-orbiting satellites.[178] In the future, NASA expects to use TDRSS space stations extensively to satisfy SRS and EESS wide bandwidth data requirements that cannot be satisfied in the band 14.896-15.121 GHz. Additionally, there are currently two new systems under development that will operate in the band 25.5-27 GHz. Specifically, NASA is developing a geostationary Solar Dynamics Observatory (SDO) system that will downlink SRS data to White Sands, New Mexico; and the National Oceanic and Atmospheric Administration (NOAA) is developing a non-geostationary National Polar-orbiting

[172] *See* BBG Comments at 2.

[173] Our engineering staff also reviewed the A04 schedule for DRM transmissions and found that power varied between 10 kW and 200 kW, except for one station that transmits 500 kW. The staff observed that Radio Netherlands is listed as broadcasting from Bonaire (an island off the coast of Venezuela) to the 48 contiguous States using 10 kW.

[174] The band 27-27.5 GHz is allocated to the fixed-satellite service (FSS) (Earth-to-space) on a primary basis in Regions 2 and 3. Footnote 5.537 states that space services using non-geostationary (NGSO) satellites operating in the ISS in the band 27-27.5 GHz are exempt from the general provision that NGSO satellite systems must not cause unacceptable interference to geostationary-satellite systems in the FSS and the broadcasting-satellite service. 47 C.F.R. § 2.106, footnote 5.537. *See* ITU *Radio Regulations*, Article 22, No. 22.2. The band 25.25-27 GHz is also allocated to the standard frequency and time signal-satellite (Earth-to-space) on a secondary basis throughout the world.

[175] 47 C.F.R. § 2.106, footnote 5.536.

[176] 47 C.F.R. § 2.106, footnote 5.536A. This footnote also states that EESS earth stations should take into account Recommendation ITU-R SA.1278. In addition, footnote 5.536B states that, in certain countries (including only Brazil in Region 2), EESS earth stations in the band 25.5-27 GHz cannot constrain the use and deployment of stations in the fixed and mobile services. 47 C.F.R. § 2.106, footnote 5.536B.

[177] There is one exception, but it is not at issue in this proceeding. Specifically, the band 27-27.5 GHz is not allocated for FSS uplinks.

[178] TDRSS satellites transmit down to LEO satellites in the band 22.55-23.55 GHz.

Operational Environmental Satellite System (NPOESS) that will downlink EESS data to a limited number of earth stations. Finally, NASA and NOAA expect to build additional wide bandwidth EESS systems in this band.

79. In the non-Federal Table, the band 25.25-27.5 GHz is allocated to the EESS (space-to-space) on a secondary basis and the segment 25.5-27 GHz is allocated to the EESS (space-to-Earth) on a secondary basis, and international footnote 5.536A has been adopted.[179]

80. On April 25, 2003, the President authorized a new national policy that establishes guidance and implementation actions for commercial remote sensing space capabilities.[180] The fundamental goal of this national policy is to "advance and protect U.S. national security and foreign policy interests by maintaining the nation's leadership in remote sensing space activities, and by sustaining and enhancing the U.S. remote sensing industry." In support of this goal, the United States Government will rely "to the maximum practical extent on U.S. commercial remote sensing capabilities for filling imagery and geospatial needs for miliary, intelligence, foreign policy, homeland security, and civil users." The national policy also states that "U.S. companies are encouraged to build and operate commercial remote sensing space systems whose operational capabilities, products, and services are superior to any current or planned foreign commercial systems." We observe that first generation commercial remote sensing satellite systems use the band 8025-8400 MHz, but the U.S. commercial remote sensing industry has identified the band 25.5-27 GHz for wider bandwidth operations.

81. Subsequently, WRC-03 allocated the band 25.5-27 GHz for SRS downlinks on a primary basis, added SRS to the list of space radiocommunication services in Article 21 of the ITU *Radio Regulations* that must adhere to maximum power flux-density (pfd) limits ("hard limits") in the band 25.25-27.5 GHz,[181] and revised footnote 5.536A to apply to both SRS and EESS earth stations. Specifically, WRC-03 revised footnote 5.536A to read as follows:

> 5.536A Administrations operating earth stations in the Earth exploration-satellite service or the space research service shall not claim protection from stations in the fixed and mobile services operated by other administrations. In addition, earth stations in the Earth exploration-satellite service or in the space research service should be operated taking into account Recommendations ITU-R SA.1278 and ITU-R SA.1625, respectively.

82. *Proposal.* We proposed to change the allocation status of the non-Federal EESS (space-to-Earth) in the band 25.5-27 GHz from a secondary to a primary allocation; to subject non-Federal authorizations to a case-by-case electromagnetic compatibility (EMC) analysis; to require that non-Federal EESS space stations transmitting in the band 25.5-27 GHz meet the pfd limits contained in Article 21 of the ITU *Radio Regulations*; to provides guidance to EESS earth station applicants, such as a

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[179] The segment 25.25-27 GHz is allocated to the standard frequency and time signal-satellite (Earth-to-space) on a secondary basis.

[180] *See* U.S. Commercial Remote Sensing Policy, April 25, 2003 Fact Sheet at http://www.ostp.gov/html/Fact%20Sheet%20-%20Commercial%20Remote%20Sensing%20Policy%20-%20April%2025%202003.pdf.

[181] *See* ITU *Radio Regulations* at Article 21 (Terrestrial and space services sharing frequency bands above 1 GHz), Section V (Limits of power flux-density from space stations), No. 21.16 and Table 21-4. Therefore, the pfd in dB(W/m²) for angles of arrival (δ) above the horizontal plane at the Earth's surface produced by emissions from EESS and SRS space stations in the band 25.5-27 GHz and from ISS space stations in the band 25.25-27.5 GHz for all conditions and for all methods of modulation must not exceed:

-115	for $0° \le \delta \le 5°$
$-115 + 0.5(\delta - 5)$	for $5° \le \delta \le 25°$
-105	for $25° \le \delta \le 90°$

These limits relate to the pfd which would be obtained under assumed free-space propagation conditions. The reference bandwidth is 1 MHz. *See WRC-03 Final Acts* at Article 21, Section V, Table 21-4.

methodology for estimating needed separation distances between EESS earth stations and fixed stations; and to warn commercial remote sensing operators not to place their receive earth stations near border areas where possible. At the request of NTIA, we sought comment from potential EESS applicants as to whether additional technical constraints would be helpful in fostering compatibility between Federal and non-Federal systems in the band 25.5-27 GHz.

83. We also proposed to broaden the secondary non-Federal EESS (space-to-space) allocation in the band 25.25-27.5 GHz to a secondary ISS allocation; to limit the use of this ISS allocation to SRS and EESS applications and to transmissions of data originating from industrial and medical activities in space; and to require that non-Federal ISS space stations transmitting in the band 25.25-27.5 GHz meet the pfd limits contained in Article 21 of the ITU *Radio Regulations*. Finally, we proposed to allocate the band 25.5-27 GHz to the SRS (space-to-Earth) on a primary basis for Federal use.

84. *Comments*. Space Imaging LLC (Space Imaging) supports the Commission's proposal to raise the non-Federal EESS downlink allocation in the band 25.5-27 GHz from secondary to primary status.[182] Space Imaging states that the commercial remote-sensing satellite industry will require a primary EESS (space-to-Earth) allocation in the 25.5-27 GHz band in the relatively near future.[183] Regarding whether additional technical constraints are needed to foster Federal/non-Federal compatibility, Space Imaging "urges the Commission to minimize any constraints that might impair the flexibility of the commercial industry to implement future remote-sensing systems in this frequency band."[184]

85. KROHNE, Inc. (Krohne) states that it has incurred significant development costs for the use of frequencies in the band 25.5-27 GHz for their new process level and measuring equipment soon to be released.[185] Krohne requests that the Commission make it clear that by adopting the proposed allocations it is in no way preventing compliant Part 15 operations in this band.

86. In its March 1, 2005 letter, NTIA states that its support for a primary non-Federal EESS allocation is based on non-Federal systems being implemented in such a way as to minimize impact on Federal allocations.[186] In particular, NTIA states that its support is contingent on a United States footnote that requires these non-Federal operations be coordinated with NTIA (through the normal "FAS" process)[187] before the Commission grants a license, *e.g.*, the current process for non-Federal EESS

[182] Space Imaging is the licensee of the IKONOS remote-sensing satellite system, a NGSO satellite system that currently uses X-band spectrum in the 8025-8400 GHz band to downlink remotely-sensed data to earth stations in the United States and other countries.

[183] Space Imaging filed the following additional information: While X-band frequencies at 8025-8400 MHz have been able to accommodate the needs of the remote sensing industry to date, second or third generation satellite systems will demand additional spectrum resources in order to be able to downlink increasing amounts of data at faster rates. The adoption of *U.S. Commercial Remote Sensing Policy (U.S. Policy)* provides added support for a primary non-Federal Government EESS allocation to accommodate the future needs of the commercial remote sensing industry. The *U.S. Policy* demonstrates the vital role the commercial remote sensing industry plays in achieving U.S. Government objectives. The *U.S. Policy* also reflects the increasing reliance the U.S. Government has placed, and will continue to place, on commercial remote sensing satellite systems. As this partnership moves forward, the commercial operators must have access to sufficient primary EESS spectrum to meet the requirements of their U.S. Government customers.

[184] *See* Space Imaging Comments at 4**.**

[185] *See* Krohne Comments at 1.

[186] *See* NTIA Letter from Fredrick R. Wentland, Associate Administrator, Office of Spectrum Management, NTIA, United States Department of Commerce, to Edmond J. Thomas, Chief, OET, dated March 1, 2005.

[187] The Frequency Assignment Subcommittee (FAS) is an IRAC subcommittee within NTIA that develops and executes procedures for the assignment and coordination of Federal radio frequencies.

operations in the band 8025-8400 MHz where authorizations are subject to a case-by-case electromagnetic compatibility analysis. In order to facilitate coordination, NTIA requests that applicants submit the following information with their applications to the Commission:

- Calculations showing how the pfd limits contained in Article 21 of the ITU *Radio Regulations* will be met at the surface of the Earth.
- For any earth stations not included in the initial application, the maximum number, the anticipated antenna diameter, and the locations of receiving earth stations that will be required to support the system.
- Information on the satellite transmission technical parameters and planned orbit that will facilitate coordination with Federal allocations. This would include high-gain space station antennas, space station transmissions only within line-of-sight of cooperating earth stations, bandwidth efficient modulation and coding techniques that will minimize the necessary bandwidth required.
- Calculations showing that the pfd at the geostationary orbit from the EESS satellites will be limited to the values indicated in ITU-R SA.1278 to protect TDRSS reception from low Earth-orbiting user spacecraft.

NTIA further states that, while it is not requesting that the above technical parameters be added to Part 25 of the Commission's Rules, non-Federal applicants need to be made aware that without this information, coordination with NTIA will be difficult, if not impossible. For instance, NTIA does not expect that the minimal technical information required by the FAS will be sufficient to accomplish the coordination process. Depending on its review of the application, NTIA states that it may request that the applicant supply additional information. NTIA states that it hopes that the non-Federal applicant in preparing this information will have a better understanding of the complexities of sharing in the band, the importance of the band to Federal users, and how to better engineer their systems in order to facilitate sharing.

87. *Decision.* We are raising the secondary non-Federal EESS downlink allocation in the band 25.5-27 GHz to primary status. We find that this allocation upgrade is necessary to meet the requirements of the commercial remote sensing industry and that it is consistent with the new national policy for commercial remote sensing space capabilities that the President authorized on April 25, 2003.[188] In order to implement this decision, we are revising footnote US258 by including the band 25.5-27 GHz in its text.[189] Accordingly, footnote US258 is revised to read as follows:

> US258 In the bands 8025-8400 MHz and 25.5-27 GHz, the Earth exploration-satellite service (space-to-Earth) is allocated on a primary basis for non-Federal use. Authorizations are subject to a case-by-case electromagnetic compatibility analysis.

Consistent with our existing policy for the band 8025-8400 MHz, the Commission will issue licenses for operation in the band 25.5-27 GHz only after coordination under footnote US258 has been completed.

88. By adding the band 25.5-27 GHz to footnote US258, we are also making each non-Federal authorization subject to a case-by-case electromagnetic compatibility (EMC) analysis. Because of existing and planned Federal SRS and EESS requirements in the band 25.5-27 GHz, which are discussed above, we find that it is important that non-Federal EESS downlinks operated in this band be designed to ensure compatibility with Federal systems. We are also adding international footnote 5.536A to the non-Federal Table in the band 25.5-27 GHz. This action provides guidance to earth station applicants, *e.g.*, Annex 1 provides a methodology for estimating needed separation distances between EESS earth

[188] *See* para. 80, *supra.*

[189] As is our standard policy, footnote US258 is being added to both the Federal and non-Federal Tables in the band 25.5-27 GHz, and consequently, we are deleting the now superfluous table entry for the secondary EESS downlink allocation from the non-Federal Table.

stations and fixed stations,[190] and alerts commercial remote sensing operators of the EESS downlink allocation's status in border areas (providing notice that, where possible, these operators should consider placing their receive earth stations away from border areas).

89. In order to protect Federal terrestrial receivers, we are requiring that non-Federal EESS space stations transmitting in the band 25.5-27 GHz meet the pfd limits contained in Article 21 of the ITU *Radio Regulations*. We are codifying this requirement by adding these pfd limits to Part 25 of the Commission's Rules. The record does not demonstrate the need for additional technical constraints on EESS applicants, and therefore, we decline to adopt the additional constraints that were suggested by NTIA.

90. We are also broadening the secondary non-Federal EESS (space-to-space) allocation in the band 25.25-27.5 GHz to a secondary ISS allocation. However, we are also adopting international footnote 5.536, which limits the use of this ISS allocation to SRS and EESS applications, and also to transmissions of data originating from industrial and medical activities in space. This restriction is necessary to ensure that this frequency band meets the needs of the scientific community without being overtaken for use by the FSS or mobile-satellite service (MSS). In order to protect Federal terrestrial receivers, we are requiring that non-Federal ISS space stations transmitting in the band 25.25-27.5 GHz meet the pfd limits contained in Article 21 of the ITU *Radio Regulations*. The ISS pfd requirements and the EESS pfd requirements are the same and would be shown once in Part 25 of the Commission's Rules.

91. At NTIA's request, we are allocating the band 25.5-27 GHz to the SRS (space-to-Earth) on a primary basis for Federal use. This action will provide a primary SRS allocation to satisfy Federal requirements for high data rate space science missions.

92. At Krohne's request, we are also clarifying the following point: The allocation changes that we are making today in no way prevent radio frequency devices that operate in accordance with the requirements codified in Part 15 from operating in this spectrum.[191]

D. RNSS and the Radiolocation Service

93. In the following paragraphs, we first discuss our RNSS proposals for the bands 1215-1300 MHz and 5000-5030 MHz and then our radiolocation service proposal for the band 2900-3100 MHz. We did not receive any comments on these proposals.

94. *Background*. The band 1164-1300 MHz is allocated to the RNSS (space-to-space) (space-to-Earth) on a primary basis throughout the world. In the United States, only the band 1164-1240 MHz has been implemented, with the entire allocation available for Federal use[192] but with only the segment

[190] *See* Recommendation ITU-R SA.1278, Annex 1 titled "Separation distances between EESS earth stations and FS stations around 26 GHz."

[191] We note that among the general conditions of operation for radio frequency (Part 15) devices is the following: Operation of an intentional, unintentional, or incidental radiator is subject to the conditions that no harmful interference is caused and that interference must be accepted that may be caused by the operation of an authorized radio station, by another intentional or unintentional radiator, by industrial, scientific and medical (ISM) equipment, or by an incidental radiator. 47 C.F.R. § 15.5(b). The Commission permits unlicensed operations in the band 25.25-27.5 GHz under the provisions of Section 15.209 (Emissions from an intentional radiator shall not exceed 500 microvolts per meter at a measurement distance of 3 meters) and Section 15.231 (periodic operations). 47 C.F.R. §§ 15.209, 15.231.

[192] The Global Positioning System (GPS) is authorized under the Federal RNSS allocation. These satellites allow anyone with a GPS receiver to determine their precise longitude, latitude, altitude, and time anywhere on the planet. GPS currently uses the RNSS allocations in the bands 1215-1240 MHz and 1559-1610 MHz.

1164-1215 MHz being available for non-Federal use (see footnote US385).[193] At WRC-03, the primary RNSS (space-to-Earth) (space-to-space) allocation in the band 1164-1215 MHz was removed from footnote 5.328A and entered directly into the International Table (table entry).[194] WRC-03 further revised footnote 5.328A to establish conditions for the protection of the aeronautical radionaviagation service (ARNS) from RNSS systems operating in the band 1164-1215 MHz.[195]

95. Internationally, the band 5000-5030 MHz is allocated to the RNSS on a co-primary basis with the ARNS, with the segment 5000-5010 MHz limited to RNSS uplinks and the segment 5010-5030 MHz limited to RNSS downlinks and crosslinks.[196] The Commission has not previously considered these RNSS allocations, and thus, the band 5000-5150 MHz is allocated to the ARNS on a primary basis and the Microwave Landing System (MLS) takes precedence over other uses of this spectrum (footnote US370).[197]

96. Prior to WRC-03, the band 2900-3100 MHz was allocated to the radionavigation service on a primary basis and to the radiolocation service on a secondary basis throughout the world and these allocations have been implemented in the United States.[198] This band is primarily used for maritime radars and radar beacons (racons) and radars of this type are required on cargo and passenger ships by international treaty (SOLAS) for safety purposes.[199] The use of the radiolocation service is generally

[193] The band 1164-1215 MHz was only recently allocated to the RNSS and this allocation is codified in footnote US385, which reads as follows: The band 1164-1215 MHz is also allocated to the radionavigation-satellite service (space-to-Earth, space-to-space) on a primary basis. In this band, stations in the radionavigation-satellite service shall not cause harmful interference to, nor claim protection from, stations of the aeronautical radionavigation service.

[194] WRC-03 also revised footnote 5.329 to establish conditions for the protection of radiodetermination services from RNSS systems in the band 1215-1300 MHz. WRC-03 decided to continue to resolve RNSS intersystem technical compatibility issues on a bilateral basis until January 1, 2005; thereafter, normal coordination procedures would apply. See Appendix A, Section 2.106, footnotes 5.328B and 5.329.

[195] See Appendix A, Section 2.106, footnote 5.328A.

[196] Prior to WRC-03, these RNSS allocations were listed in footnotes 5.443A and 5.443B. At WRC-03, the primary RNSS uplink allocation in the band 5000-5010 MHz was removed from international footnote 5.443A and made a table entry and footnote 5.443A was suppressed. The primary RNSS downlink and crosslink allocations in the band 5010-5030 MHz were removed from international footnote 5.443B and were made table entries. Footnote 5.443B was modified to remove the RNSS allocation and to specify that RNSS systems must comply with the pfd limits in the band 4990-5000 MHz defined in Resolution 741. Those pfd limits are more stringent than the current provisional limit of -171 dB(W/m²) in a 10 megahertz band at any RAS site for no more than two percent of the time. Under Resolution 741, the pfd produced in the band 4990-5000 MHz by any GSO RNSS network operating in the band 5010-5030 MHz must not exceed the current limit at all times, that is, no two percent exception. For NGSO RNSS networks, the limit is significantly tightened to -245 dB(W/m²) in a 10 megahertz band at any RAS site for no more than two percent of the time.

[197] MLS currently operates only in the segment 5030-5091 MHz. Footnote 5.367 states that the band 5000-5150 MHz is also allocated to the aeronautical mobile-satellite (R) service on a primary basis, but this allocation is unused. In footnote US211, the Commission urges applicants for airborne or space station assignments to take all practicable steps to protect RAS observations in the band 4990-5000 MHz. See 47 C.F.R. § 2.106, footnotes 5.367, 5.444, US211, and US370.

[198] The Commission has previously adopted footnote 5.427, which states the response from radar transponders must not be capable of being confused with the response from radar beacons (racons) and must not cause interference to ship or aeronautical radars in the radionavigation service.

[199] Racons operate in conjunction with maritime radars to provide electronic markers to identify maritime obstructions and navigation points. *See* http://www.tscm.com/nebbia4.html.

limited to the military services.[200] WRC-03 raised the allocation status of the radiolocation service in the band 2900-3100 MHz from secondary to primary and adopted footnote 5.424A, which requires that stations in the radiolocation service not cause harmful interference to, nor claim protection from, radar systems in the radionavigation service.[201]

97. *Proposals.* We proposed to remove the RNSS downlink and crosslink allocations in the band 1164-1215 MHz from footnote US385 and to make them table entries. We also proposed to adopt international footnote 5.328A, which requires that RNSS stations in the band 1164-1215 MHz operate in accordance with Resolution 609 (WRC-03) and that they not claim protection from ARNS in the band 960-1215 MHz. We requested comment on whether the RNSS allocation at 1215-1240 MHz, which is currently limited to Federal use, should be expanded to the full international allocation (1215-1300 MHz) and whether this RNSS allocation should be made available for both Federal and non-Federal use.

98. We proposed to allocate the band 5000-5010 MHz for RNSS uplinks and the band 5010-5030 MHz for RNSS downlinks and crosslinks and consequently to remove the band 5000-5030 MHz from the spectrum in which MLS has precedence over other uses, that is, to replace footnote US370 with international footnote 5.444. We proposed to limit the adjacent band pfd at the Earth's surface from RNSS operations in the band 5010-5030 MHz through the adoption of international footnote 5.443B.[202]

99. At the request of NTIA, we proposed to raise the allocation status of the Federal radiolocation service in the band 2900-3100 MHz from secondary to primary status and to add international footnote 5.424A to the Federal Table to protect important ship navigation systems. We requested comment on whether this upgrade should also apply to the non-Federal radiolocation service.

100. *Decision*. We did not receive any comments that addressed our proposals for the RNSS and the radiolocation service. Accordingly, we are adopting our proposals. First, we are entering "RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space)" in the U.S. Table for the band 1164-1215 MHz.[203] We are adopting international footnote 5.328A, which requires that RNSS stations in the band 1164-1215 MHz operate in accordance with Resolution 609 (WRC-03) and that they not claim protection from ARNS in the band 960-1215 MHz. At the request of NTIA, we are adding footnote G132 to the Federal Table, which reads as follows:[204]

> G132 Use of the radionavigation-satellite service in the band 1215-1240 MHz shall be subject to the condition that no harmful interference is caused to, and no protection is claimed from, the radionavigation service authorized under ITU Radio Regulation No. 5.331. Furthermore, the use of the radionavigation-satellite service in the band 1215-1240 MHz shall be subject to the condition that no harmful interference is caused to the radiolocation service. ITU Radio Regulation No. 5.43 shall not apply in respect of the radiolocation service. ITU Resolution 608 (WRC-03) shall apply.

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[200] Footnote G56 states that Federal radiolocation in the band 2900-3100 MHz is primarily for the military services; however, limited use is permitted by other Federal agencies for survey operations and in support of experimentation and research programs. Footnote US44 states that the non-Federal radiolocation service may be authorized on the condition that no harmful interference is caused to Federal operations. 47 C.F.R. § 2.106, footnotes US44 and G56.

[201] See Appendix A, Section 2.106, footnote 5.424A.

[202] Footnote 5.443B is shown in para. 102, *infra.*

[203] Previously, the RNSS (space-to-Earth) (space-to-space) allocation was listed in footnote US385. Consequently, footnote US385 is being deleted.

[204] *See* NTIA recommendations on WRC-03 implementation, Enclosure 1 at Agenda Item 1.15 and Enclosure 2 at p. 59. We note that since the band 1240-1300 MHz is not allocated to the RNSS in the United States, NTIA has created footnote G132, which is based on footnote 5.329, except that footnote G132 applies only to the band 1215-1240 MHz, whereas footnote 5.329 applies to the band 1215-1300 MHz.

101. Because the record indicated no interest on the matter by any party, we decline to expand the RNSS allocation at 1215-1240 MHz, which is currently limited to Federal use, to the band 1215-1300 MHz and to make it available for both Federal and non-Federal use.

102. Second, we are allocating the band 5000-5030 MHz to the RNSS on a primary basis for Federal and non-Federal use and we are limiting the use of the segment 5000-5010 MHz to uplink transmissions and the segment 5010-5030 MHz to downlink and crosslink transmissions. Consequently, we are replacing footnote US370 with international footnote 5.444, thereby removing the band 5000-5030 MHz from the spectrum in which MLS has precedence over other uses. In order to protect MLS operations above 5030 MHz and radio astronomy observations in the band 4990-5000 MHz, we are limiting the adjacent band pfd at the Earth's surface from RNSS operations in the band 5010-5030 MHz through the adoption of international footnote 5.443B, which reads as follows:

> 5.443B In order not to cause harmful interference to the microwave landing system operating above 5030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5030-5150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5010-5030 MHz shall not exceed –124.5 dB(W/m²) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4990-5000 MHz, radionavigation-satellite service systems operating in the band 5010-5030 MHz shall comply with the limits in the band 4990-5000 MHz defined in Resolution 741 (WRC-03).

103. Third, at the request of NTIA, we are raising the allocation status of the Federal radiolocation service in the band 2900-3100 MHz to primary and we are adding international footnote 5.424A to the Federal Table in order to protect important ship navigation systems.[205] This allocation upgrade will increase the usefulness of this spectrum without causing any burden on existing operations. In particular, we note that, mainly as a result of newer radar design features that mitigate received radar-to-radar interference, NTIA reports that radionavigation radars operating in the band 2900-3100 MHz have demonstrated compatible operations with radiolocation systems.[206] Because the record indicated no interest on the matter by any party, we decline to upgrade the allocation status of the non-Federal radiolocation service in the band 2900-3100 MHz.

E. Allocation Status of the Little LEO Feeder Link Bands

104. *Background.* In 1995, NTIA released its *Spectrum Reallocation Final Report*, wherein the bands 1390-1400 MHz and 1427-1432 MHz (1.4 GHz Bands) were identified for reallocation from Federal use to exclusive non-Federal use.[207] In its spectrum reallocation final plan, NTIA stated that, in order to protect important radio astronomy observations in the band 1400-1427 MHz, non-Federal "airborne and space-to-Earth transmissions [should] be prohibited" in the band 1390-1400 MHz and that such operations should be "avoided" in the band 1427-1432 MHz.[208]

105. In 2001, the Commission reallocated 27 MHz of Government transfer spectrum, including the bands 1390-1392 MHz and 1430-1432 MHz.[209] In that action, the Commission provisionally allocated these bands to the FSS on a primary basis, limited the use of these FSS allocations to feeder

[205] *See* NTIA recommendations on WRC-03 implementation, Enclosure 1 at Agenda Item 1.17 and Enclosure 2 at p. 20.

[206] *See U.S. Proposal for WRC-03*, Agenda Item 1.17, at pages 60-61.

[207] *See Spectrum Reallocation Final Report - Response to Title VI - Omnibus Budget Reconciliation Act to 1993*, U.S. Department of Commerce, NTIA Special Publication 95-32, February 1995, at page 5-3.

[208] *Id.*

[209] Reallocation of the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands, ET Docket No. 00-221, *Report and Order and Memorandum Opinion and Order*, 17 FCC Rcd 368, at 384-394, paras. 36-60 (2002) (*27 MHz Report and Order*).

links[210] for the Non-Voice NGSO MSS (popularly known as "Little LEOs"), limited the use of the FSS allocation in the band 1390-1392 MHz to Earth-to-space transmissions (Little LEO feeder uplinks), and limited the use of the FSS allocation in the band 1430-1432 MHz to space-to-Earth transmissions (Little LEO feeder downlinks).[211] The Little LEO feeder link allocations were contingent on the adoption of similar international allocations, the completion of spectrum sharing studies, and additional coordination and technical limitations.[212] Footnote US368 incorporates these conditions, which were adopted as part of the *27 MHz Report and Order*.[213]

106. In the *27 MHz Report and Order*, the Commission also allocated the band 1390-1392 MHz to the fixed and mobile except aeronautical mobile services on a co-primary basis with the provisional FSS uplink allocation and decided to license these terrestrial services on an unpaired basis. The Commission maintained the primary land mobile service allocation in the band 1430-1432 MHz, shifted the Wireless Medical Telemetry Service (WMTS) out of this spectrum, except that WMTS operations in seven cities will continue to operate in the segment 1430-1431.5 MHz,[214] and otherwise made this band available for commercial telemetry use, such as meter reading. The secondary fixed service allocation in the band 1430-1432 MHz, which was limited to telemetry uses, was raised to primary status.[215] In making the provisional Little LEO feeder downlink allocation, the Commission stated the following:

> We do not believe that the addition of Little LEO feeder downlinks in this band [1430-1432 MHz] will preclude the use of the band by telemetry systems due to the low PFD levels of the satellite signals relative to the power levels of telemetry systems. We are confident that such limits will not preclude satellite earth stations in this band. However, these earth stations may have to locate in rural areas and use large, high

[210] A feeder link is defined as a radio link from an earth station at a given location to a space station, or vice versa, conveying information for a radiocommunication service other than for the FSS. The given location may be at a specified fixed point, or at any fixed point within specified areas. 47 C.F.R. § 2.1.

[211] 17 FCC Rcd at 392 and 393, paras. 50 and 55.

[212] *27 MHz Report and Order*, 17 FCC Rcd 369, 392 at paras. 2 and 52. In the Commission's Rules, 1.85 megahertz of spectrum has been designated for use by Little LEO downlinks (137-138 MHz and 400.15-401 MHz) and 2.2 megahertz of spectrum has been designated as being available for use by Little LEO uplinks (148-150.05 MHz and 399.9-400.05 MHz). 47 C.F.R. § 25.202(a)(3). This spectrum is to be used for both feeder links and service links (radio links from subscriber units to a space station or vice versa). Accordingly, the provision of separate dedicated feeder link spectrum near 1400 MHz would permit greater service link use.

[213] Footnote US368 reads as follows: "The band 1390-1392 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis and the band 1430-1432 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis, limited to feeder links for the Non-Voice Non-Geostationary Mobile-Satellite Service, and contingent on (1) the completion of sharing studies including the measurement of emissions from equipment that would be employed in operational systems and demonstrations to validate the studies as called for in Resolution 127 (WRC-2000), (2) the adoption of worldwide feeder link allocations at the 2003 World Radiocommunication Conference (WRC-03), and (3) compliance with any technical and operational requirements that may be imposed at WRC-03 to protect passive services in the 1400-1427 MHz band from unwanted emissions associated with such allocations. These allocations become effective upon adoption of worldwide allocations at WRC-03. If no such allocations are adopted by WRC-03, these allocations shall be considered null and void, with no grandfathering of rights. Individual assignments shall be coordinated with the Interdepartmental Radio Advisory Committee's (IRAC) Frequency Assignment Subcommittee (FAS) (see, for example, Recommendations ITU-R RA.769-1 and ITU R SA.1029-1) to ensure the protection of passive services in the 1400-1427 MHz band. Coordination shall not be completed until the feeder downlink system is tested and certified to be in conformance with the technical and operational requirements for the protection of passive services in the 1400-1427 MHz band. Certification and all supporting documentation shall be submitted to the Commission and FAS prior to launch."

[214] 47 C.F.R. § 2.106, footnote US350. See para. 155, *infra*, wherein we are amending footnote US350 for purposes of clarity.

[215] The Commission revised footnote US311 to take note of the fact that RAS observations are made in the band 1350-1400 MHz on an unprotected basis at 16 sites. 47 C.F.R. § 2.106, footnote US311.

> gain antennas to ensure reception of the satellite signals. Because we anticipate that telemetry operations will be concentrated largely in urban areas, sharing can be readily accomplished.[216]

107. The protection of the passive services in the band 1400-1427 MHz, which lies between the Little LEO feeder link bands, has been one of the Commission's major concerns during its consideration of these FSS allocations.[217] The band 1400-1427 MHz is allocated to the RAS, EESS (passive), and SRS (passive) on a co-primary basis throughout the world, and international footnote 5.340 states that all emissions are prohibited in this spectrum.[218] In the United States, the band 1400-1427 MHz is Federal/non-Federal shared spectrum and the international allocations have been implemented. In order to protect the passive services in the band 1400-1427 MHz, the United States has adopted three footnotes: Footnote US246 states that no station may transmit in the band 1400-1427 MHz; footnote US74 states that the RAS will be protected from "extraband radiation" only to the extent that such radiation exceeds the level permitted for a properly operated station; and footnote US368 requires that Little LEO feeder link licensees comply "with any technical and operational requirements that may be imposed at WRC-03 to protect passive services in the 1400-1427 MHz band from 'unwanted emissions' associated with such allocations."[219]

108. At WRC-03, the United States obtained conditional support for a worldwide secondary allocation for Little LEO feeder links. Specifically, WRC-03 adopted footnote 5.339A, which reads as follows:

> 5.339A *Additional allocation:* the band 1390-1392 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a secondary basis and the band 1430-1432 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a secondary basis. These allocations are limited to use for feeder links for non-geostationary-satellite networks in the mobile-satellite service with service links below 1 GHz, and Resolution 745 (WRC-03) applies.

In Resolution 745, WRC-03 resolves that the Little LEO feeder link allocations "shall not be used until the completion of ITU-R studies on all identified compatibility issues as shown in Annex 1 of this Resolution and the results of these studies shall be reported to WRC-07 [World Radiocommunication Conference, 2007] and the decisions should be taken by WRC-07 accordingly."[220]

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[216] *27 MHz Report and Order*, 17 FCC Rcd at 393, para. 56 (internal footnote omitted).

[217] For example, in the *27 MHz Report and Order*, the Commission noted that the sharing studies then "underway contemplated a satellite allocation in the 1429-1432 MHz band, but we have limited this allocation to the 1430-1432 MHz band which will provide an additional megahertz of guard band between the downlinks and the EESS and RAS Services." In addition, the Commission observed that the flexible allocation in the band 1390-1392 MHz also allows this spectrum to be used for Little LEO feeder uplinks and that this allocation is consistent with the views expressed by the National Academy of Sciences through the National Research Council's Committee on Radio Frequencies (CORF), which requested that uplink transmissions be limited to spectrum below 1392 MHz. (CORF stated that uplinks should be prohibited above 1392 MHz in order to protect passive sensor operations in the band 1400-1427 MHz, which use ultra-sensitive receivers and high-gain antennas.) *27 MHz Report and Order*, 17 FCC Rcd at 390, 392, 393, paras. 47, 52, 55.

[218] 47 C.F.R. § 2.106, footnote 5.340. The band 1400-1427 MHz is allocated to the RAS because the rest frequency of neutral hydrogen (HI) is at 1420.406 MHz and its observation is one of the radio-frequency lines of the greatest importance to radio astronomy. *See* ITU *Handbook on Radio Astronomy*, Radiocommunication Bureau, Geneva, 1995 at page 13.

[219] 47 C.F.R. § 2.106, footnotes US74, US246, US368.

[220] *See WRC-03 Final Acts* at Resolution 745 (Protection of existing services in all Regions from non-geostationary-satellite networks in the fixed-satellite service using the frequency bands around 1.4 GHz on a secondary basis), *resolves* 1.

109. *Proposal.* We tentatively concluded that WRC-03's decision regarding Little LEO feeder links should be implemented. We proposed to downgrade the provisional Little LEO feeder link allocations in the Table of Frequency Allocations from primary to secondary status, and retain but revise footnote US368 to reflect the actions taken at WRC-03 by requiring the completion of ITU-R studies on all identified compatibility issues as shown in Annex 1 of Resolution 745 (WRC-2003) and to make any use of the worldwide feeder links subject to any further compatibility decisions by WRC-07.

110. *Comments.* Final Analysis Communication Services, Inc. (Final Analysis) opposes the proposal to change the allocation status of the current domestic Little LEO feeder link allocations from co-primary to secondary.[221] Final Analysis argues that the domestic co-primary allocation is effective, based on the meeting of the three contingencies spelled out in footnote US368. Final Analysis states that the first contingency was satisfied when tests, measurements and studies were completed by a U.S. laboratory and submitted in a U.S. document that sought support of WRC-03 Agenda Item 1.16.[222] Final Analysis states that the second contingency was satisfied when the secondary allocation, as specified in footnote 5.339A, was adopted at WRC-03. Final Analysis states that the third contingency was satisfied because the WRC-03 made any Little LEO system filing an application for domestic use of the bands subject to decisions taken at WRC-07, including any provisions to protect other services in the band and passive services in adjacent bands. Final Analysis states that it continues to participate in the ITU-R study groups that support the Little LEO feeder link allocation.

111. Based in its confidence that the required ITU-R studies on compatibility will be completed before WRC-07 and that the international allocations will be changed to primary status, Final Analysis argues that it makes no sense to downgrade the domestic allocations to secondary now only to later reinstate the co-primary status. It also argues that implementing a secondary allocation would not serve the public interest. Final Analysis also claims that the current co-primary allocation ensures that spectrum will be available for all interested users and will permit Little LEO satellite systems to successfully co-exist with terrestrial users in the same band because licensees must coordinate operations and provide sufficient interference protection to both existing and future operations of the allocated services. It also argues that because feeder links are critical to the commercial implementation of Little LEO service, we should maintain the co-primary allocation in the band.[223]

112. Final Analysis does not oppose the proposed revisions to footnote US368**,** provided that the Commission clarifies that an applicant can apply for and obtain authority for domestic use of these bands on a co-primary basis for Little LEO feeder link operations prior to WRC-07, so long as the requirements of US368 are otherwise met.

113. In its March 8, 2005 letter, NTIA recommends that protection of the passive services in the band 1390-1427 MHz (*i.e.*, the RAS in the band 1390-1427 MHz and the EESS (passive) and SRS (passive) in the band 1400-1427 MHz) from emissions in frequency bands that were part of the Government Transfer Bands reallocated in ET Docket No. 00-221 (1.4 GHz Bands) be more directly

[221] *See* Final Analysis Comments at 1. *But see* NTIA Letter, dated October 15, 2004.

[222] Final Analysis says it believes that these study results demonstrated the practicability of attenuating unwanted emissions from Little LEO feeder links in excess of what is required to protect the passive services in the band 1400-1427 MHz. The study results were submitted to WRC-03 within WRC03/38 Addendum 1 and WRC03/38 Addendum 2.

[223] Final Analysis states that feeder link transmissions support data transfers and Tracking, Telemetry & Command (TT&C) functions between earth stations and the satellites, and that sufficient dedicated spectrum in both uplink and downlink directions is vital to ensure proper operation of the satellite constellation and to achieve full system capacity.

addressed.[224] NTIA states that the reallocation of the 1.4 GHz Bands to non-Federal use was predicated on these bands not being used in the future for satellite downlinks or aircraft-to-ground emissions, which have the potential to cause severe interference to the passive services.[225] NTIA recommends that the restrictions on these nearby bands appear in a new United States footnote, which would read as follows: "In the bands 1390-1400 MHz and 1427-1432 MHz airborne and space-to-Earth operations, except for feeder downlinks for the Non-Voice Non-Geostationary Mobile-Satellite Service in the band 1430-1432 MHz (see US368), are prohibited."

114. In light of the specific restrictions embodied in US368, NTIA states that adding a cross reference to footnote US368 in footnote US74 would provide useful information. NTIA also requests that footnote US74 be amended by using the term "unwanted emissions" in used in place of "extraband radiation." NTIA notes that unwanted emissions consist of spurious emissions and out-of-band emissions and that this term is defined in both the ITU *Radio Regulations* and in the Commission's Rules. Because both spurious and out-of-emissions are of concern in the case of footnote US74, NTIA asserts that unwanted emissions would be the proper term to use in footnote US74.

115. *Decision.* WRC-03 allocated spectrum for Little LEO feeder links on a secondary basis throughout the world and resolved that use of these allocations is contingent on the subsequent completion of ITU-R spectrum sharing studies to determine the impact of these NGSO FSS operations on incumbent services, including passive service operations in the adjacent band 1400-1427 MHz. Furthermore, Resolution 745 indicates that any Little LEO use of these bands is subject to additional decisions on compatibility issues that may be adopted at WRC-07.[226] For these reasons, we disagree with Final Analysis that the conditions set forth in footnote US368 have been met. The *27 MHz Report and Order*, which added footnote US368, adopted the conditional co-primary allocation in anticipation of the completion of studies and adoption of a like allocation at WRC-03.[227] By contrast, WRC-03 adopted worldwide secondary allocations for the band, added further conditions on its use, and continued to require studies of the band. These developments were not anticipated by the text of the *27 MHz Report and Order* nor by the terms of footnote US368.[228]

116. Although the decision made at WRC-03 is inconsistent with the provisions outlined in footnote US368, we find it serves the public interest to maintain but revise the conditional allocations to reflect the WRC-03 action. Thus, we adopt our proposal to implement WRC-03's decision regarding Little LEO feeder links. We will require the completion of ITU-R studies on all identified compatibility issues as shown in Annex 1 of Resolution 745 (WRC-2003) and make any use of the worldwide feeder links subject to any further compatibility decisions by WRC-07. Accordingly, we are amending the Table entries for the FSS uplink allocation in the band 1390-1392 MHz and the FSS downlink allocation in the band 1430-1432 MHz to show secondary status in lieu of primary status, and we are revising footnote US368 to read as follows:

[224] *See* NTIA Letter from Fredrick R. Wentland, Associate Administrator, Office of Spectrum Management, NTIA, United States Department of Commerce, to Edmond J. Thomas, Chief, OET, dated March 8, 2004.

[225] NTIA states that an exception was made for Little LEO feederlinks on the condition that full protection would be provided (see US368).

[226] WRC03/38, *resolves* 2.

[227] *See 27 MHz Report and Order*, 17 FCC Rcd at 369, 392 and 393, paras. 2, 52 and 55 (stating, *e.g.*, that use of the feeder link allocations "is contingent on the adoption of a *similar* international allocation" (emphasis added)).

[228] For example, we do not believe that WRC-03's secondary allocation can be considered similar to the provisional co-primary allocation, nor that the sharing studies can be considered complete in light of ongoing studies in anticipation of WRC-07.

> US368 The use of the bands 1390-1392 MHz and 1430-1432 MHz by the fixed-satellite service is limited to feeder links for the Non-Voice Non-Geostationary Mobile-Satellite Service and is contingent on: (1) the completion of ITU-R studies on all identified compatibility issues as shown in Annex 1 of Resolution 745 (WRC-2003); (2) measurement of emissions from equipment that would be employed in operational systems and demonstrations to validate the studies as called for in Resolution 745 (WRC-2003); and (3) compliance with any technical and operational requirements that may be imposed at WRC-07 to protect other services in these bands and passive services in the band 1400-1427 MHz from unwanted emissions. The FCC shall coordinate individual assignments with NTIA (see, for example, Recommendations ITU-R RA.769-2 and ITU-R SA.1029-2) to ensure the protection of passive services in the band 1400-1427 MHz. As part of the coordination requirements, the feeder uplink and downlink systems shall be tested and certified to be in conformance with the technical and operational out-of-band requirements for the protection of passive services in the band 1400-1427 MHz. Certification and all supporting documentation shall be submitted to the FCC at least three months prior to launch.

117. We reject as speculative Final Analysis' assertion that we should maintain a conditional co-primary allocation because WRC-07 may change the secondary international allocation to primary status.[229] We do not believe it serves the public interest to preserve a provisional co-primary allocation in the band that is inconsistent with the WRC-03 decision, particularly because we cannot predict whether the contingencies provided in footnote US368 will be successfully met.[230] Regardless of the provisional allocation afforded to Little LEO use of the band, parties interested in using the frequencies for feeder link operations will have to take into account the unresolved status of the band and potential added expense associated with planning for its use. Alternately, they may continue to use the spectrum that has already been made available for Little LEO feeder and service link operations, and that is free of any contingencies.[231]

118. Finally, we note that the Little LEO feeder links protection requirements for passive services are specified in footnote US368 and that these requirements go beyond the more general protection criteria described in footnote US74. Therefore, in order to ensure that readers of footnote US74 do not overlook the specific restrictions embodied in US368, we are adding a cross reference to footnote US368 in footnote US74. We are also using the term "unwanted emissions" in place of "extraband radiation" in footnote US74.[232] Finally, we are also adding a statement in our Rules that airborne and space-to-Earth operations are prohibited in the Government transfer bands 1390-1400 MHz and 1427-1432 MHz, with the exception of Little LEO feeder downlinks in the band 1430-1432 MHz.[233] This action makes explicit our previous decisions not to allocate additional spectrum in this frequency

[229] Accordingly, we decline at this time to decide whether we would authorize use of these bands prior to WRC-07.

[230] Although Final Analysis describes the burdens associated with operating under a secondary allocation in the band, we note that under the co-primary model, other users face expenses associated with evaluating and planning to co-exist with Little LEO operations that may or may not satisfy the provisions necessary to make use of the band. Moreover, we note that the lack of a specified pfd limit for this band increases the difficulty for other co-primary users, especially medical telemetry operators in the band 1430-1431.5 MHz in the seven cities specified in footnote US350, to plan for effective shared use of this spectrum.

[231] *See* note 212, *supra.*

[232] In addition to providing consistency by using "unwanted emissions," we note that a definition for "extraband radiation" is not currently provided in our Rules. Unwanted emissions consistent of spurious emissions and out-of-band emissions. 47 C.F.R. § 2.1.

[233] The action that we take today is in line with our previous decision for the band 2305-2310 MHz. Specifically, the Commission allocated the band 2305-2310 MHz to the fixed, mobile except aeronautical mobile, and radiolocation services on a primary basis for non-Federal use and to the amateur service on a secondary basis. Nonetheless, the Commission also adopted footnote US338 (which prohibits space-to-Earth operations in the band 2305-2310 MHz) in order to protect NASA's Goldstone deep space facility (which receives in the band 2290-2300 MHz) for the implementation of future space radiocommunication services.

range to airborne or downlink operations and has been requested by NTIA. Accordingly, we are adopting new United States footnote US398, which will read as follows:

> US398 In the bands 1390-1400 MHz and 1427-1432 MHz, airborne and space-to-Earth operations, except for feeder downlinks for the Non-Voice Non-Geostationary Mobile-Satellite Service in the band 1430-1432 MHz (see US368), are prohibited.

F. Remaining Space Radiocommunication Service Issues

119. *Background.* The remaining space radiocommunication service issues concern a new Federal EESS (active) allocation in the band 432-438 MHz, moving an existing Federal SRS deep space uplink allocation in the band 7145-7190 MHz from a footnote and entering this allocation directly in the Federal Table, and raising the secondary Federal SRS allocation in the band 14.8-15.35 GHz to primary status.

120. In the United States, the band 432-438 MHz is allocated to the radiolocation service on a primary basis for Federal use[234] and to the amateur service on a secondary basis.[235] International footnote 5.282 has been adopted domestically and thus, the amateur-satellite service may operate in the segment 435-438 MHz subject to not causing harmful interference to other services operating in accordance with the International Table. WRC-03 allocated the band 432-438 MHz to the EESS (active) on a secondary basis throughout the world and adopted an international footnote (5.279A) that effectively limits the operational use of 432-438 MHz EESS to areas outside the United States.[236] However, NASA has indicated a need to perform some limited pre-operational testing of its systems within line-of-sight of its U.S. control stations. In order to account for the required use of the EESS allocation in the United States, NTIA recommended that a new United States footnote be adopted.[237]

121. At WRC-03, the SRS deep space uplink allocation in the band 7145-7235 MHz, which previously had been shown in footnote 5.460, was moved up as a table entry.[238] Footnote 5.460 was revised to delete the SRS allocation and to state that geostationary SRS satellites operating in the band 7190-7235 MHz may not claim protection from existing and future stations of the fixed and mobile

[234] The use of the radiolocation service allocation is limited to the military services, except that pulse-ranging and spread spectrum radiolocation systems may be authorized for Federal non-military and non-Federal use on a secondary basis along the shorelines of the 48 contiguous States and Alaska. 47 C.F.R. § 2.106, footnotes G2 and US217.

[235] In the areas listed in footnote US7, special conditions apply to use the amateur service allocation. 47 C.F.R. § 2.106, footnote US7.

[236] Footnote 5.279A reads as follows: The use of this band by sensors in the Earth exploration-satellite service (active) shall be in accordance with Recommendation ITU-R SA.1260-1. Additionally, the Earth exploration-satellite service (active) in the band 432-438 MHz shall not cause harmful interference to the aeronautical radionavigation service in China. The provisions of this footnote in no way diminish the obligation of the Earth exploration-satellite service (active) to operate as a secondary service in accordance with Nos. 5.29 and 5.30.

[237] On February 20, 2004, NTIA addressed this EESS allocation in a letter to the Commission. *See* letter from Fredrick R. Wentland, Associate Administrator, Office of Spectrum Management, NTIA, to Edmond J. Thomas, Chief, OET, dated February 20, 2004.

[238] Prior to WRC-03, the band 7145-7235 MHz was allocated for SRS uplinks on a primary basis by footnote 5.460, which restricted the segment 7145-7190 MHz to deep space use and prohibited deep space communications in the segment 7190-7235 MHz. The band 7125-7235 MHz is allocated to the fixed and mobile services on a primary basis throughout the world. Footnote 5.458 states that passive microwave sensor measurements may be carried out in the band 7125-7235 MHz and that administrations should bear in mind the needs of the EESS (passive) and the SRS (passive) in their future planning of the band 7125-7250 MHz. 47 C.F.R. § 2.106, footnotes 5.458 and 5.460.

services.[239] In the United States, this SRS allocation has been implemented in footnote US252 and its use is limited to Goldstone, California.[240]

122. At WRC-03, the United States requested that the secondary SRS allocation in the band 14.8-15.35 GHz be raised to primary status in order to satisfy requirements for high data rate space science missions, but the Conference was unable to agree to this allocation upgrade because fixed service users were opposed to the change.[241] Notwithstanding this outcome at WRC-03, NTIA recommends that the Federal SRS allocation be raised to primary status because TDRSS[242] and other SRS operations support vital national interests and warrant primary status, and because studies and operational experience undisputedly show that SRS operations can share with existing services.[243] NTIA also recommends that footnote US310 be revised by using a one megahertz reference bandwidth (instead of the current four kilohertz reference bandwidth) and by correspondingly increasing the pfd limit by 24 dB.[244]

123. *Proposal*. We proposed to allocate the band 432-438 MHz to the EESS (active) on a secondary basis for Federal use and to require that space stations operating under this allocation not cause harmful interference to, nor claim protection from, the radiolocation, amateur, and amateur-satellite services in the United States. We proposed to move the SRS deep space uplink allocation currently authorized in footnote US252 to a table entry in the Federal Table for the band 7145-7190 MHz and to make consequential changes to footnotes US252 and US262. We proposed to raise the secondary SRS allocation in the band 14.8-15.35 GHz to primary status for Federal use.[245] We also proposed to update footnote US310 by using a reference bandwidth that is more appropriate for today's digital transmissions.

124. *Comments*. The only comments that we received concerning these space radiocommunication service proposals were from Mr. James Whedbee (Whedbee), an amateur operator, and the ARRL, both of whom support allocating the band 432-438 MHz to the EESS (active) for the limited Federal use that would be authorized under footnote US397.[246] In particular, we note that ARRL states that it enjoys a positive working relationship with NASA that will allow coordination of any EESS (active) testing without interference to ongoing amateur operations in the band 432-438 MHz.[247] ARRL

[239] See Appendix A, Section 2.106, footnote 5.460.

[240] 47 C.F.R. § 2.106, footnote US252.

[241] *See U.S. Proposals for WRC-03*, Proposal C (Agenda Item 1.12), at pages 51-52.

[242] TDRSS, which is a communication signal relay system that provides tracking and data acquisition services between low earth orbiting (LEO) spacecraft and NASA/customer control and/or data processing facilities, is the principle SRS use of the band 14.8-15.35 GHz.

[243] In the United States, the band 14.8-15.35 GHz is primarily allocated for Federal operations with only limited non-Federal use authorized through footnote allocations.

[244] Footnote US310 authorizes non-Federal SRS satellites in low Earth orbit to transmit to TDRSS on a secondary basis in the segment 14.896-15.121 GHz. 47 C.F.R. § 2.106, footnote US310. In its request to NTIA for this change, NASA states that the pfd reference bandwidth listed in footnote US310 should be updated to one megahertz in order to correct an error in the *NTIA Manual* and to more appropriately reflect the change from analog to digital transmissions.

[245] As an exception, we note that footnote 5.339 has previously been added to the Federal and non-Federal Tables, and thus, SRS (passive) use of the segment 15.2-15.35 GHz would be authorized on a secondary basis, irrespective of the primary SRS table entry.

[246] *See* Whedbee Comments at 1 and ARRL Reply Comments at 2-3.

[247] ARRL states that it believes that NASA is aware of: (1) the extensive use of the 432 MHz band for amateur terrestrial weak-signal communications and for propagation beacons; (2) AMSAT operations in the band 435-438 MHz; and (3) auxiliary links in the band 433-435 MHz.

states that it is confident that it will be able to work with NASA to accommodate its needs while avoiding interference to ongoing amateur operations in the band 432-438 MHz.

125. *Decision*. At the request of NTIA, we are making allocation changes to three frequency bands. First, we are allocating the band 432-438 MHz to the EESS (active) on a secondary basis for Federal use and are requiring that space stations operating under this allocation not cause harmful interference to, nor claim protection from, the radiolocation, amateur, and amateur-satellite services in the United States. This action will permit NASA to perform limited pre-operational testing of its systems within line-of-sight of its U.S. control stations and appears to be feasible given the evidence of NASA's good relations with the amateur community as reflected in the record. Accordingly, we are adopting footnote US397, which reads as follows:

> US397 In the band 432-438 MHz, the Earth exploration-satellite service (active) is allocated on a secondary basis for Federal use. Stations in the Earth exploration-satellite service (active) shall not be operated within line-of-sight of United States except for the purpose of short duration pre-operational testing. Operations under this allocation shall not cause harmful interference to, nor claim protection from, any other services allocated in the band 432-438 MHz in the United States, including secondary services and the amateur-satellite service.

126. Second, we are displaying the Federal SRS deep space uplink allocation, which is currently authorized in footnote US252, as a table entry in the Federal Table for the band 7145-7190 MHz.[248] This action clarifies that the band 7145-7190 MHz is allocated to the SRS (deep space) (Earth-to-space) on a primary basis for Federal use and highlights that this SRS uplink use is limited to deep space communications. In addition, we are maintaining the non-Federal SRS deep space uplink allocation as a footnote allocation, are specifying that this unused allocation has secondary status, and are moving this allocation and the Goldstone site restriction to footnote US262.[249] Accordingly, footnotes US252 and US262 are revised to read as follows:

> US252 The band 2110-2120 MHz is also allocated to the space research service (deep space) (Earth-to-space) on a primary basis at Goldstone, California.
>
> US262 The band 7145-7190 MHz is also allocated to the space research service (deep space) (Earth-to-space) on a secondary basis for non-Federal use. The use of the bands 7145-7190 MHz and 34.2-34.7 GHz by the space research service (deep space) (Earth-to-space) and of the band 31.8-32.3 GHz by the space research service (deep space) (space-to-Earth) is limited to Goldstone, California.

127. NTIA has recently limited the use of the Federal SRS uplink allocation in the band 7190-7235 MHz by its adoption of footnote G133, which read as follows:[250]

> G133 No emissions to deep space shall be effected in the band 7190-7235 MHz. Geostationary satellites in the space research service operating in the band 7190-7235 MHz shall not claim protection from existing and future stations of the fixed and mobile services and No. 5.43A does not apply.

128. Third, we are raising the secondary SRS allocation in the band 14.8-15.35 GHz to primary status for Federal use, except in segment 15.2-15.35 GHz where SRS (passive) operations would continue

[248] In order to implement this allocation, the band 7125-7190 MHz in the Federal Table is subdivided into the bands 7125-7145 MHz and 7145-7190 MHz.

[249] Currently, footnote US252 applies to both the 2110-2120 MHz and 7145-7190 MHz. As a consequence of moving the SRS uplink allocation for deep space communications in the band 7145-7190 MHz to a table entry in the Federal Table and to footnote US262 for non-Federal use, footnote US252 now applies only to the band 2110-2120 MHz.

[250] We note that footnote G133 is the same as footnote 5.460, except that the now superfluous SRS deep space uplink allocation has been deleted, and this footnote was recently added to the *NTIA Manual*.

to be authorized on a secondary basis.[251] We find that the United States has developed extensive SRS operations in this band at great expense and these operations merit the protection that a primary allocation provides. We are revising footnote US310 by using a reference bandwidth that is more appropriate for today's digital transmissions than a reference bandwidth based on an analog channel.[252] See Appendix A for footnote US310's revised text.

G. ITU Terms and Definitions

129. In order to reflect additions and revisions to the terms and definitions listed in the ITU *Radio Regulations* and in the *WRC-03 Final Acts*, we are amending Section 2.1 of the Commission's Rules[253] to: (1) add definitions for adaptive system, high altitude platform station (HAPS), out-of-band domain of an emission, and spurious domain of an emission; (2) revise the definitions for coordinated universal time (UTC), coordination area, coordination distance, facsimile, geostationary satellite, harmful interference, inclination of an orbit of an earth satellite, telegraphy, and telephony; and (3) make minor editorial modifications to the definitions for administration, broadcasting service, mobile service, permissible interference, power, public correspondence, radio, radiocommunication, safety service, semi-duplex operation, telecommunication, and telegram. In addition, we are correcting a typographical error in the definition for telemetry in Section 2.1 and we are revising the definition for UTC in Section 73.701. The definitions of these terms are shown in Appendix A.

H. Editorial Amendments

130. We are also taking this opportunity to make various non-substantive changes to Parts 2, 90, and 97 the Commission's Rules. In Part 2, we are updating and correcting Section 2.1 through Section 2.106.[254] The main effect of these actions is to reflect the *WRC-03 Final Acts* in these rule sections; to use consistent terminology in these rules, *e.g.*, Federal and non-Federal; to remove confusing and unnecessary material from the U.S. Table; and to update the FCC Rule Part cross references. In addition, we are correcting a typographical error in Part 90 and are revising Part 97 to reflect the realignment of allocations above 71 GHz and to make other needed editorial revisions.

131. *Consistent Use of "Federal" and "non-Federal."* As an initial matter, we are adopting a unified terminology for spectrum management purposes throughout our Rules. Regulatory authority for radio spectrum in the United States is bifurcated. The Commission has regulatory authority for all non-Federal radio services, including those operated by State and local government licensees, and NTIA has regulatory authority for all Federal radio services.[255]

132. Historically, the Commission's Rules have stated that radio spectrum was allocated to either "Government" or "non-Government" use exclusively or to shared use.[256] In the *1999 Table Clean-up Order*, the Commission, with the concurrence of NTIA, decided to use the adjectives "Federal Government" and "non-Federal Government" in order to highlight its regulatory authority over State and

[251] Specifically, because the table entry for the SRS allocation is not limited, the full range of SRS operations (SRS uplinks, SRS downlinks, SRS (active), and SRS (passive)) may operate on a primary basis in the band 14.8-15.35 GHz, except in the segment 15.2-15.35 GHz where footnote 5.339 limits SRS (passive) use to secondary status.

[252] The Commission has never issued a license for SRS use under footnote US310.

[253] 47 C.F.R. § 2.1. Terms and definitions listed in Section 2.1 are the definitive terms and definitions that prevail throughout the Commission's Rules.

[254] 47 C.F.R. §§ 2.1, 2.100-2.106.

[255] 47 C.F.R. § 2.105(a).

[256] 47 C.F.R. § 2.105(b), edition of 1999.

local government licensees.[257] Subsequently, NTIA expressed concern that the adjective "non-Federal Government" could be grammatically confusing. Therefore, the Commission and NTIA have begun to use "Federal" and "non-Federal" in recently adopted United States footnotes. We believe that the Commission's Rules should, where possible, consistently use the same terminology.[258] Accordingly, we are replacing the adjectives "Federal Government" and "Government" with "Federal" and the adjectives "non-Federal Government" and "non-Government" with "non-Federal" in Section 2.102 (Assignment and use of frequencies), Section 2.103 (Government use of non-Government Frequencies), Section 2.105 (United States Table of Frequency Allocations), Section 2.106 (Table of Frequency Allocations), and Section 97.303 (Frequency sharing requirement for amateur stations).[259] In particular, we note that because of this action, 68 United States footnotes, three non-Federal Government footnotes, and 14 Federal Government footnotes are amended in Section 2.106 of our Rules. The amendments to the United States footnotes and Federal Government footnotes are made with the concurrence of NTIA. See Appendix A for the text of these revised rule sections.

1. Sections 2.1 through 2.105

133. *Section 2.1 (Terms and definitions).* With the assistance of NTIA, we have developed definitions for five terms that are commonly used in spectrum management, which we are also adding to Section 2.1. These terms are Frequency Assignment Subcommittee (FAS), Government Master File (GMF), Interdepartment Radio Advisory Committee (IRAC), International Telecommunication Union (ITU),[260] and the National Telecommunications and Information Administration (NTIA).[261] See Appendix A at Section 2.1 for the definitions.

134. *Changes to Sections 2.100-2.105.* We are updating Section 2.100 (International regulations in force) to state that the ITU *Radio Regulations*, edition of 2004, have been incorporated to the extent practicable in Subpart A (Terminology) and Subpart B (Allocation, Assignment, and Use of Radio Frequencies) of Part 2.

135. We are retitling Section 2.101 as "Frequency and wavelength bands" and are revising the text of this section to mirror ITU Radio Regulation Nos. 2.1 and 2.2.[262] In particular, we note that in communications between administrations and the ITU, no names, symbols or abbreviations should be used for the various frequency bands other than those specified in revised Section 2.101.

[257] Amendment of Part 2 of the Commissions' Rules to Make Non-Substantive Revisions to the Table of Frequency Allocations, Memorandum Opinion and Order, 15 FCC Rcd 3459 at 3461, note 13 (2000) (*1999 Table Clean-up Order*). The *1999 Table Clean-up Order* was issued by the Commission's Office of Engineering and Technology and Office of Managing Director.

[258] We make the following exceptions to this general principle: (1) The title of the Federal Table in column 4 of § 2.106 will continue to be shown as "Federal Government;" (2) The title of the non-Federal Table in column 5 of § 2.106 will continue to be shown as "Non-Federal Government;" (3) The title of the list of non-Federal footnotes will continue to be shown as "Non-Federal Government (NG) Footnotes;" and (4) The title of the list of Federal footnotes will continue to be shown as "Federal Government (G) Footnotes." If we did not make these exceptions, it would not be readily apparent to the public that footnotes that consist of the letter "G" followed by one or more numbers are Federal footnotes, which are listed only in the Federal Table, and footnotes that consist of the letter "NG" followed by one or more numbers are non-Federal footnotes, which are listed only in the non-Federal Table.

[259] 47 C.F.R. §§ 2.102, 2.103, 2.105, 2.106, and 97.303.

[260] The definition for the ITU was taken from the ITU's home page, which is http://www.itu.int/home/index.html.

[261] The definition for NTIA was taken from note 4 of the *NPRM*. We also added the link for NTIA's internet home page.

[262] *See* ITU *Radio Regulations*, Article 2, Nos. 2.1 and 2.2.

136. We are revising Section 2.102(a) to state that frequency assignments between 9 kHz and 275 GHz (instead of 400 GHz) must generally be in accordance with the Table of Frequency Allocations. In order to improve its readability and consistency with our Rules, we are amending Section 2.102(b)(3) to read as follows:[263]

> Experimental stations, pursuant to part 5, may be authorized the use of any frequency or frequency band not exclusively allocated to the passive services (including the radio astronomy service).

137. In Sections 2.102(c)(1), 2.103(a)(1), and 2.103(b)(3), we are using the abbreviation "NTIA" for the term "National Telecommunication and Information Administration" without first introducing it because we are adding this term and its abbreviation to Section 2.1 (Terms and definitions). In Section 2.103(b)(4), we are adding two missing section symbols to the last sentence, which now reads as follows: "See 47 CFR §§ 90.179 and 90.421 of this chapter."

138. We are revising Section 2.104 (International Table of Frequency Allocations) as follows. In Sections 2.104(b)(1) and 2.104(b)(3), the spelling of "Kazakhstan" is updated by adding an "h" and "the" is added to "Russian Federation." In Section 2.104(c)(ii), "Syria" is replaced by "Syrian Arab Republic." In Section 2.104(c)(4)(ii)(B), "Libya" is replaced by "Libyan Arab Jamahiriya." In Section 2.104(c)(4)(iii), we are adding "(see Article 6 of the ITU *Radio Regulations*)." In Section 2.104(g) (Miscellaneous provisions), we are updating the Commission's Rules to reflect three WRC-2000 changes. Specifically, we are revising paragraphs (g)(1) and (h)(5) and are adding paragraph (g)(2),[264] which will read as follows:

> (g)(1) Where it is indicated in the International Table that a service or stations in a service may operate in a specific frequency band subject to not causing harmful interference to another service or to another station in the same service, this means also that the service which is subject to not causing harmful interference cannot claim protection from harmful interference caused by the other service or other station in the same service.
>
> (g)(2) Where it is indicated in the International Table that a service or stations in a service may operate in a specific frequency band subject to not claiming protection from another service or from another station in the same service, this means also that the service which is subject to not claiming protection shall not cause harmful interference to the other service or other station in the same service.
>
> (h)(5) The footnote references which appear in the International Table below the allocated service or services apply to more than one of the allocated services, or to the whole of the allocation concerned.

2. Section 2.106

139. In Section 2.106 of the Commission's Rules (the Table of Frequency Allocations), we are amending the International Table (columns 1-3), the U.S. Table (columns 4 and 5), and the FCC Rule Part cross references (column 6) as described in the following paragraphs.[265]

a. Changes to the International Table

140. We are taking the following actions in order to reflect the ITU's Table of Frequency Allocations[266] in Section 2.106 of the Commission's Rules.[267] First, we are revising the provisional text of

[263] 47 C.F.R. § 2.102(b)(3). Specifically, we are adding a comma between "stations" and "pursuant" and, consistent with ITU usage, we will not capitalize the term "radio astronomy service."

[264] As a consequence of adding a new paragraph (g)(3), we are renumbering existing § 2.104(g)(2) as § 2.104(g)(3).

[265] 47 C.F.R. § 2.106.

[266] *See* ITU *Radio Regulations*, edition of 2004, Article 5, Section IV.

[267] The ITU's Table of Frequency Allocations is labeled as the International Table in the Commission's Rules. The International Table is included in the Commission's Rules for informational purposes only. 47 C.F.R. §§ 2.104 and 2.106 (columns 1, 2, and 3).

thirteen international footnotes, which have previously been added to the Commission's Rules, to comport with the 2004 edition of the ITU *Radio Regulations*.[268] Second, we are revising the provisional numbering of four international footnotes to their final numbering format.[269] Third, footnote 5.555A is removed from the International Table and footnote 5.555B is added to the Region 1 Table.[270] Fourth, footnote 5.538 is revised by inserting a missing plus sign.[271] Fifth, we are revising the table entries in the International Table and the list of international footnotes to reflect the *WRC-03 Final Acts* in those frequency bands not otherwise discussed herein. Sixth, in accordance with the 2004 edition of the ITU *Radio Regulations*, we are amending twelve international footnotes in order to add notes by the ITU Secretariat and to update the existing note to international footnote 5.552A.[272] The ITU Secretariat revised these footnotes because, while WRC-03 had revised eight Resolutions and abrogated one Resolution, the conference neglected to update the footnotes to reflect these actions.

b. Changes to the United States Table

141. In the following paragraphs, we are taking several actions that will update, correct, and otherwise improve the usability of the U.S. Table.[273] Specifically, we are: (1) removing the ARNS

[268] Using the *Provisional WRC-03 Final Acts*, we have previously taken the following actions with regard to international footnotes in Section 2.106: (1) added footnote 5.447E and revised footnotes 5.453, 5.454, and 5.455 in the *5 GHz Report and Order*; (2) added footnotes 5.457A, 5.504C, 5.505, 5.506A, 5.506B, 5.508, 5.508A, and 5.509A in the *Above 28 MHz Report and Order*; and (3) added footnotes 5.516B and 5.551I in the *V-band Second Report and Order*. Subsequently, the ITU published the final version of these international footnotes in the 2004 edition of the ITU *Radio Regulations*.

[269] In the *NPRM*, the provisional numbering of four international footnotes was inadvertently shown. Therefore, in accordance with the 2004 edition of the ITU *Radio Regulations*, we are renumbering international footnotes 5.418AA, 5.418AB, 5.418AC, and 5.418AD as footnotes 5.417A, 5.417B, 5.417C, and 5.417D, respectively.

[270] WRC-03 suppressed footnote 5.555A and added footnote 5.555B. In the *V-band Second Report and Order*, the text of footnote 5.555B was inadvertently associated with footnote number 5.555A.

[271] 47 C.F.R. § 2.106, footnote 5.538.

[272] Specifically, we are renumbering note 7 to international footnote 5.552A as note 3, adding note 3 to ten other international footnotes, and adding revised note 7 to one international footnote, as follows:

International Footnote	Resolution	Note by the ITU Secretariat:
5.79A	339 (Rev.WRC-97)[3]	[3]*Note by the Secretariat:* This Resolution was revised by WRC-03.
5.82	331 (Rev.WRC-97)[3]	
5.136, 5.143, 5.146, and 5.151	21 (Rev.WRC-95)[3]	
5.345	528 (WARC-92)[3]	
5.351A	225 (WRC-2000)[3]	
5.396	33 (Rev.WRC-97)[3]	
5.530	525 (WARC-92)[3]	
5.552A	122 (WRC-97)[3]	
5.287	341 (Rev.WRC-97)[7]	[7]*Note by the Secretariat:* This Resolution was abrogated by WRC-03.

[273] At our March 10, 2005 open meeting, we also amended page 54 of Table of Frequency Allocations by revising the band 3650-3700 MHz as follows: (1) deleted footnote US245 from the Federal and non-Federal Tables; (2) deleted footnote NG170 from the non-Federal Table; (3) added footnote NG185 to the non-Federal Table; and (4) added cross references to Satellite Communications (Part 25) and Private Land Mobile Radio Services (Part 90). We reflect these amendments herein. Unlicensed Operation in the Band 3650-3700 MHz, ET Docket No. 04-151; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band, ET Docket No. 02-380; and Amendment of the Commission's Rules With Regard to the 3650-3700 MHz Government Transfer Band, ET Docket No. 98-237, *Report and Order*, FCC 05-56, adopted March 10, 2005.

allocation in the band 1240-1300 MHz from footnote 5.334 and making it a table entry; (2) making significant changes to five footnotes (US25, US87, US266, US320, and US350), which are discussed individually, (3) removing the amateur service allocation in the band 219-220 MHz from footnotes NG152 and making it a table entry, and revising footnotes US229 and NG152 in a section titled "The Government Transfer Band 216-220 MHz;" (4) removing the Federal space operation service (Earth-to-space) allocation in the band 1761-1842 MHz from footnote G42 and making it a table entry, revising footnotes US378, G42, and G118, and deleting footnote NG176 in a section titled "The Band 1710-1850 MHz;" (5) making various minor changes to seven footnotes (US81, US112, US342, US352, NG42, NG142, and NG169); and (6) deleting three footnotes (US238, NG129, and NG151). We are also correcting the placement of several footnotes in the Federal and non-Federal Tables.

142. *New ARNS Table Entry.* Currently, footnote 5.334 is listed in both the Federal and non-Federal Tables, and thus, the band 1240-1300 MHz is allocated to the ARNS on a primary basis for Federal and non-Federal use.[274] At WRC-03, this ARNS allocation was moved to footnote 5.331, but its primary status was not explicitly stated, and thus, footnote 5.331 is unsuitable for use in the U.S. Table. Accordingly, we are transferring the primary ARNS allocation in the band 1240-1300 MHz from international footnote 5.334 to a table entry in the Federal and non-Federal Tables.[275]

143. *Footnote US25.* Prior to its recent revision, footnote US25 authorized the use of frequencies in the band 25.85-26.1 MHz throughout the United States and its insular areas to non-Federal remote pickup broadcast base and mobile stations on the condition that harmful interference is not caused the reception of international broadcast stations.[276] Section 74.402 lists seven channels in the band 25.85-26.1 MHz and four channels in the band 26.1-26.175 MHz that may be assigned for use by broadcast remote pickup stations.[277]

144. In the *Below 28 MHz Report and Order*, footnote US25 was revised to permit broadcast auxiliary remote pickup stations to continue to operate on four frequencies in the band 26.1-26.175 MHz, but at that time, the band 25.85-26.1 MHz was inadvertently deleted from footnote US25. We take this opportunity to correct this error. In addition, we observe that the Commission's Rules state that the band 26.1-26.175 MHz may be assigned to low power auxiliary stations.[278] Therefore, we revise footnote US25 to account for this authorized use. Accordingly, we are revising footnote US25 to read as follows:

[274] 47 C.F.R. § 2.106, footnote 5.334.

[275] Footnote 5.334 was suppressed at WRC-03, and thus, we are removing it from our Rules.

[276] Prior to its revision, footnote US25 read as follows: The use of frequencies in the band 25.85-26.1 MHz may be authorized in any area to non-Government remote pickup broadcast base and mobile stations on the condition that harmful interference is not caused to stations in the broadcasting service. 47 C.F.R. § 2.106, footnote US25 (2002 Edition).

[277] Specifically, the frequencies 25.87 MHz, 25.91 MHz, 25.95 MHz, 25.99 MHz, 26.03 MHz, 26.07 MHz, and 26.09 MHz (which are in the band 25850-26100 kHz) and the frequencies 26.11 MHz, 26.13 MHz, 26.15 MHz, 26.17 MHz (which are in the band 26100-26175 kHz) are available for use by remote pickup stations. 47 C.F.R. § 74.402(a). On November 29, 2004, Commission staff conducted a study of these bands and found that the Commission has issued 86 licenses for broadcast auxiliary stations in the band 25.85-26.1 MHz and 212 licenses for broadcast auxiliary stations in the band 26.1-26.175 MHz.

[278] Section 74.802 states that frequencies in the band 26.100-26.480 MHz may be assigned for use by low power auxiliary stations. 47 C.F.R. § 74.802(a). However, the segment 26.175-26.480 MHz is already allocated to the land mobile service on a primary basis for non-Federal use. 47 C.F.R. § 2.106. Thus, we are revising footnote US25 to authorize low power auxiliary stations only in the segment 26.100-26.175 MHz, which is not currently authorized in the Table of Frequency Allocations. We observe that as of November 29, 2004, the Commission has issued 154 licenses for low power auxiliary stations in the band 26.100-26.480 MHz.

US25 The use of frequencies in the band 25.85-26.175 MHz may be authorized in any area to non-Federal remote pickup broadcast base and mobile stations on the condition that harmful interference is not caused to stations of the broadcasting service in the band 25.85-26.1 MHz and to stations of the maritime mobile service in the band 26.1-26.175 MHz. Frequencies within the band 26.1-26.175 MHz may also be assigned for use by low power auxiliary stations.

145. *Footnote US87.* NTIA recently requested that footnote US87 be clarified in order to provide Federal and non-Federal entities with additional flexibility.[279] Footnote US87 currently reads as follows:

US87 The frequency 450 MHz, with maximum emission bandwidth of 500 kHz, may be used by Government and non-Government stations for space telecommand at specific locations, subject to such conditions as may be applied on a case-by-case basis.

146. NTIA states that a number of Federal and non-Federal entities have expressed confusion regarding the intent of footnote US87. Specifically, these entities have interpreted footnote US87 to mean that operations are limited to those with a carrier frequency at 450 MHz. NTIA does not believe that this is the intent of footnote US87. NTIA also states that it recognizes that Federal and non-Federal entities would like to have their bandwidth include 450 MHz but have their carrier frequency center above or below 450 MHz. NTIA states that, based on the existing sharing environment, space telecommand transmissions "should remain as close to 450 MHz as practicable."[280]

147. NTIA observes that footnote 5.286 provides the type of flexibility that is needed in footnote US87. Specifically, footnote 5.286 provides a 500 kilohertz band (449.75-450.25 MHz), within which operators have the flexibility to operate 250 kHz above or below 450 MHz. Footnote 5.486 and NTIA's proposed revision of footnote US87 read as follows:

5.286 The band 449.75-450.25 MHz may be used for the space operation service (Earth-to-space) and the space research service (Earth-to-space), subject to agreement obtained under No. 9.21.

US87 The band 449.75-450.25 MHz may be used by Federal and non-Federal stations for space telecommand (Earth-to-space) at specific locations, subject to such conditions as may be applied on a case-by-case basis. Operators shall take all practical steps to keep the carrier frequency close to 450 MHz.

148. As requested by NTIA, we are clarifying footnote US87. This action provides Federal and non-Federal entities with additional flexibility, but also requires that their operations remain as close to 450 MHz as practicable.

149. *The Government Transfer Band 216-220 MHz.* In *27 MHz Report and Order*, the band 216-220 MHz was transferred from Federal and non-Federal shared use to mixed-use status.[281] Specifically, the Commission revised the band 216-220 MHz in the Federal Table by downgrading the primary maritime mobile service allocation to secondary status and by then merging that allocation with the existing secondary aeronautical mobile and land mobile service allocations to form a secondary mobile service allocation.[282] Because footnote US229 states that no new Federal assignments may be authorized in the band 216-217 MHz after January 1, 2002; and because international footnote 5.241, which has previously been added to the U.S. Table, states that no new stations in the radiolocation service

[279] *See* NTIA Letter from Fredrick R. Wentland, Associate Administrator, Office of Spectrum Management, NTIA to Edmond J. Thomas, Chief, OET, dated January 19, 2005.

[280] *Id.*

[281] *27 MHz Report and Order*, 17 FCC Rcd at 375-384, paras. 14-35.

[282] The mobile service includes the aeronautical mobile, land mobile, and maritime mobile services. In addition, the band 216-220 MHz was allocated to the fixed and mobile except aeronautical services on a co-primary basis for non-Federal use.

may be authorized in the band 216-220 MHz, we recommended to NTIA that these unused allocations, which are no longer available for Federal use, be deleted from the Federal Table. We also suggested to NTIA that footnote US229 should be clarified by specifying the coordinates in tenths of a second, which is approximately three meters; and by stating that: (1) the three Space Surveillance (SPASUR) radars transmit at a very high power and that other operations may be affected within a specified radius of these transmitters; (2) only the six receive sites need to be protected; (3) the coordinate datum is referenced to the North American Datum 1983 (NAD83); (4) Silver Lake is located in Mississippi (not Missouri). NTIA concurred. Accordingly, we are replacing the mobile service allocation in the band 216-217 MHz with a land mobile service allocation, removing the radiolocation service allocation from the band 217-220 MHz, revising footnote G2 (which specifies the bands in which the use of the Federal radiolocation service is limited to the military services) to remove the band 217-220 MHz, and revising footnote US229 to read as follows:

> US229 Federal use of the fixed and land mobile services in the band 216-220 MHz and of the aeronautical mobile service in the band 217-220 MHz shall be limited to telemetering and associated telecommand operations. After January 1, 2002, no new Federal assignments shall be authorized in the band 216-217 MHz. The sub-band 216.88-217.08 MHz is allocated to the radiodetermination service on a primary basis for Federal use, limited to the Navy's Space Surveillance (SPASUR) radar system at the following nine sites (Coordinate datum: NAD83).
>
> (a) Three stations transmit at a very high power and other operations may be affected within the following areas:

Transmitter sites	Coordinates	Frequency	Interference radius
Gila River (Phoenix), AZ……..	33° 06' 32" N, 112° 01' 45" W	216.97 MHz..	150 km (93.2 miles)
Lake Kickapoo (Archer City), TX	33° 32' 47" N, 98° 45' 46" W	216.983 MHz	250 km (155.3 miles)
Jordan Lake (Wetumpka), AL…...	32° 39' 33" N, 86° 15' 52" W	216.99 MHz..	150 km

> (b) Reception of the sub-band 216.965-216.995 MHz shall be protected from harmful interference within 50 kilometers (31.1 miles) of the following sites:

Receive sites	Coordinates
Elephant Butte, NM……	33° 26' 35" N, 106° 59' 50" W
Fort Stewart, GA…….	31° 58' 36" N, 081° 30' 34" W
Hawkinsville, GA……..	32° 17' 20" N, 083° 32' 10" W
Red River, AR…….	33° 19' 48" N, 093° 33' 01" W
San Diego, CA…..……..	32° 34' 42" N, 116° 58' 11" W
Silver Lake, MS……..	33° 08' 42" N, 091° 01' 16" W

150. In the band 219-220 MHz, we are moving the secondary amateur service allocation from footnote NG152 to the body of the non-Federal Table in order to highlight this important use.[283] Consequently, we are removing the now superfluous amateur service allocation from footnote NG152. Accordingly, footnote NG152 is revised to read as follows:

> NG152 The use of the band 219-220 MHz by the amateur service is limited to stations participating, as forwarding stations, in point-to-point fixed digital message forwarding systems, including intercity packet backbone networks.

Finally, we are updating the FCC Rule Part cross references so that Personal Radio Services (Part 95) is listed in the band 216-219 MHz and the Amateur Radio Service (Part 97) is listed in the band 219-220 MHz.

151. *Footnote US266.* We are updating footnote US266 by changing "public safety radio service(s)" to "Public Safety Radio Pool;" by deleting the unused segment 157.45-157.47 MHz from the

[283] Because of the need to subdivide the band 216-220 MHz into two bands (216-217 MHz and 217-220 MHz) in the Federal Table, we can subdivide the band 216-220 MHz into two bands (216-219 MHz and 219-220 MHz) in the non-Federal Table without needlessly expanding the size of the Table of Frequency Allocations.

band 156.27-157.47 MHz; and by deleting the unused frequency 161.97 MHz.[284] Accordingly, we are amending footnote US266 to read as follows:

> US266 Non-Federal licensees in the Public Safety Radio Pool holding a valid authorization on June 30, 1958, to operate in the frequency band 156.27-157.45 MHz or on the frequencies 161.85 MHz or 161.91 MHz may, upon proper application, continue to be authorized for such operation, including expansion of existing systems, until such time as harmful interference is caused to the operation of any authorized station other than those licensed in the Public Safety Radio Pool.

152. *Footnote US320.* In 1993, the Commission allocated the bands 137-138, 148-150.05, 399.9-400.05 MHz and 400.15-401 MHz to the MSS for use by low-earth orbit satellites (popularly known as "Little LEOs") and limited the use of this spectrum through the adoption of eight United States footnotes, including US320, US322, and US326, which read as follows:[285]

> US320 Use of the 137-138, 148-149.9, and 400.15-401 MHz bands by the mobile-satellite service is limited to non-voice, non-geostationary satellite systems and may include satellite links between land earth stations at fixed locations.
>
> US322 The 149.9-150.05 MHz band is allocated to the mobile-satellite service (Earth-to-space) on a primary basis after 1 January 1997 and shall be limited to non-voice, non-geostationary satellite systems, including satellite links between land earth stations. Before 1 January 1997 use of this band on a secondary basis for the mobile satellite service is allowed for land earth stations at fixed locations.
>
> US326 The 399.9-400.05 MHz band is allocated to the mobile-satellite service (Earth-to-space) on a primary basis after January 1, 1997 and shall be limited to non-voice, non-geostationary satellite systems, including satellite links between land earth stations.

153. In the *1999 Table Clean-up Order*, the Commission deleted expired information and combined footnotes US322 and US326 into a single footnote US322, which read as follows:[286]

> US322 Use of the bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service (Earth-to-space) is limited to non-voice, non-geostationary satellite systems, including satellite links between land earth stations.

154. In the *Above 28 MHz Report and Order*, the Commission merged footnote US322 into US320, that is, added the bands 149.9-150.05 MHz and 399.9-400.05 MHz to footnote US320, and deleted footnote US322 from the U.S. Table.[287] However, while the band 149.9-150.05 MHz was correctly added to footnote US320 in the final rules, the band 399.9-400.05 MHz was inadvertently omitted from footnote US320 in the final rules. Accordingly, we take this opportunity to correct footnote US320, which will read as follows:

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[284] By unused, we mean that no public safety pool use is listed for the segment 157.45-157.47 MHz or the frequency 161.97 MHz in the ULS.

[285] Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed-Satellite Service and the Mobile-Satellite Service for Low-Earth Orbit Satellites, ET Docket No. 91-280, *Report and Order*, 8 FCC Rcd 1812 (1993). Specifically, the Commission allocated: (1) the bands 137-137.025 MHz, 137.175-137.825 MHz, and 400.15-401 MHz to the MSS (space-to-Earth) on a primary basis; (2) the bands 137.025-137.175 and 137.825-138 MHz to the MSS (space-to-Earth) on a secondary basis; (3) the band 148-149.9 MHz to the MSS (Earth-to-space) on a primary basis; and (4) the bands 149.9-150.05 MHz and 399.9-400.05 MHz to the MSS (Earth-to-space) on a secondary basis until 1997 and on a primary basis thereafter.

[286] Amendment of Part 2 of the Commission's Rules to make Non-Substantive Revisions to the Table of Frequency Allocations, *Memorandum Opinion and Order*, DA 99-2743, 15 FCC Rcd 3459 (2000) (*1999 Table Clean-up Order*). In that action, "150.05" was inadvertently shown as "150.5".

[287] *Above 28 MHz Report and Order*, 18 FCC Rcd at 23456, 23458, paras. 79 and 90.

US320 The use of the bands 137-138 MHz, 148-150.05 MHz, 399.9-400.05 MHz, and 400.15-401 MHz by the mobile-satellite service is limited to non-voice, non-geostationary satellite systems and may include satellite links between land earth stations at fixed locations.

155. *Footnote US350.* We find that footnote US350 is needlessly confusing and herein amend this United States footnote for clarity.[288] First, we note that the bands 608-614 MHz and 1395-1400 MHz are allocated to the land mobile service on a primary basis for Federal and non-Federal use and that footnote US350 limits the use of these bands to medical telemetry and medical telecommand. Therefore, we are revising the Table entry for the bands 608-614 MHz and 1395-1400 MHz from "LAND MOBILE US350" to "LAND MOBILE (medical telemetry and medical telecommand)."[289] This action will highlight these important medical applications. We are also revising the text of footnote US390 to more closely parallel Section 90.259(b) of the Commission's Rules and to clearly state that Federal agencies have full use of the medical telemetry and medical telecommand allocation in the band 1427-1432 MHz.[290] Accordingly, footnote US350 is amended to read as follows:

US350 In the band 1427-1432 MHz, Federal use of the land mobile service and non-Federal use of the fixed and land mobile services is limited to telemetry and telecommand operations as described below:

(a) *Medical operations.* The use of the band 1427-1432 MHz for medical telemetry and telecommand operations (medical operations) shall be authorized for both Federal and non-Federal stations.

(1) Medical operations shall be authorized on a primary basis in the band 1427-1429.5 MHz and on a secondary basis in the band 1429.5-1432 MHz in the United States and its insular areas, except in the following locations: Austin/Georgetown, TX; Detroit and Battle Creek, MI; Pittsburgh, PA; Richmond/Norfolk, VA; Spokane, WA; and Washington, DC metropolitan area (collectively, the "carved-out" locations). See 47 C.F.R. §§ 90.259(b)(4) and 95.630(b) for a detailed description of these locations.

(2) In the carved-out locations, medical operations shall be authorized on a primary basis in the band 1429-1431.5 MHz and on a secondary basis in the bands 1427-1429 MHz and 1431.5-1432 MHz.

(b) *Non-medical operations.* The use of the band 1427-1432 MHz for non-medical telemetry and telecommand operations (non-medical operations) shall be limited to non-Federal stations.

(1) Non-medical operations shall be authorized on a secondary basis to the Wireless Medical Telemetry Service (WMTS) in the band 1427-1429.5 MHz and on a primary basis in the band 1429.5-1432 MHz in the United States and its insular areas, except in the carved-out locations.

(2) In the carved-out locations, non-medical operations shall be authorized on a secondary basis in the band 1429-1431.5 MHz and on a primary basis in the bands 1427-1429 MHz and 1431.5-1432 MHz.

156. *The Band 1710-1850 MHz.* In 2003, the Commission allocated 90 megahertz of spectrum in the bands 1710-1755 MHz and 2110-2155 MHz for use by Advanced Wireless Services (AWS), including third generation (3G) wireless systems.[291] The band 1710-1755 MHz was a Government

[288] Section 90.259 and footnote US350 were amended in the *27 MHz Service Rule Report and Order*. Amendment of Parts 1, 2, 27, and 90 of the Commission's Rules to License Services in the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands, WT Docket No. 02-8, *Report and Order*, 17 FCC Rcd 9980 at para. 192 (2002) (*27 MHz Service Rule Report and Order*).

[289] In the case where there is a parenthetical addition to an allocation in the U.S. Table, that service allocation is restricted to the type of operation so indicated. 47 C.F.R. § 2.105(d)(4).

[290] 47 C.F.R. § 90.259(b). The Commission has previously decided to permit Federal agencies to have access to the WMTS bands, including bands that were reallocated for exclusive non-Federal use (1395-1400 MHz and 1427-1432 MHz). Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service, ET Docket 99-255, PR Docket 92-235, *Report and Order*, FCC 00-211, 15 FCC Rcd 11206 (2000); and *27 MHz Report and Order*, 17 FCC Rcd at 368, para. 3, note 10, and footnote US350.

[291] Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems, ET Docket No. 00-258, *Second Report and Order*, 17 FCC Rcd 23193 (2003).

transfer band that was reallocated from exclusive Federal use to mixed use status. Specifically, the table entries for the fixed and mobile service allocations in the band 1710-1755 MHz were removed from the Federal Table, the band 1710-1755 MHz was allocated to the fixed and mobile services on a co-primary basis for non-Federal use, and footnotes US378 and NG176 were adopted.

157. Footnote US378 codifies the transition plan for the Government transfer band 1710-1755 MHz and specifies the locations where Federal operations may continue. In pertinent part, footnote US378 provides that Federal stations in the fixed and mobile services will operate on a primary basis until reallocated in accordance with the "Strom Thurmond National Defense Authorization Act for Fiscal Year 1999."

158. The Commission found that it served the public interest to allocate the band 1710-1755 MHz to the fixed and mobile services on a co-primary, but delayed basis. Specifically, the Commission made this AWS allocation available for use on January 1, 2004 and codified this decision in footnote NG176.

159. On December 29, 2004, Chairman Powell notified NTIA that the Commission plans to commence the auction of licenses in the band 1710-1755 MHz as early as June 2006.[292] In preparation for the auction of the Government transfer band 1710-1755 MHz, we are amending three footnotes (US378, NG176, and G118) to the U.S. Table that pertain to the band 1710-1755 and one footnote (G42) that that pertains to the Federal band 1755-1850 MHz.

160. First, at the request of NTIA, we are amending footnotes US378 and G118 in order to align these footnotes with the Commercial Spectrum Enhancement Act.[293] Specifically, footnote US378 is revised by updating the applicable Act under which the reaccommodation of Federal stations must occur (from the "Strom Thurmond National Defense Act for fiscal year 1999" to the "Commercial Spectrum Enhancement Act"). We are revising footnote G118 to state that Federal fixed stations may be authorized in the band 1700-1710 MHz only if spectrum is not available in the band 1755-1850 MHz (instead of the band 1710-1850 MHz).

161. Second, we are deleting footnote NG176 because the fixed and mobile service allocations in the band 1710-1755 MHz, which will be auctioned for AWS use, are now effective.

162. Third, at the request of NTIA, we are reflecting a recent change to the Federal Table in the band 1755-1850 MHz.[294] Specifically, the primary allocation to the space operation service (Earth-to-space) in the band 1761-1842 MHz is moved from footnote G42 and this allocation is displayed as a table entry.[295] Consequently, footnote G42 is amended to read as follows:

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[292] Letter from Michael K. Powell, Chairman, FCC, to Michael D. Gallagher, Assistant Secretary for Communications and Information, U.S. Department of Commerce, dated December 19, 2004. The Commercial Spectrum Enhancement Act requires the Commission to notify NTIA at least 18 months prior to the commencement of any auction of eligible frequencies identified in the legislation, including the band 1710-1755 MHz.

[293] *See* letter from Fredrick R. Wentland, Associate Administrator, Office of Spectrum Management, NTIA, to Mr. Edmond J. Thomas, Chief, OET, dated February 28, 2005.

[294] *See* NTIA Letter from Fredrick R. Wentland, Associate Administrator, Office of Spectrum Management, NTIA, United States Department of Commerce, to Edmond J. Thomas, Chief, OET, dated March 1, 2005. Mr. Wentland states that NTIA has already made the modifications to footnote G42 in the *NTIA Manual* and requests that the Commission modify § 2.106 as soon as possible.

[295] Currently, footnote G42 reads as follows: Space command, control, range and range rate systems for earth station transmission only (including installations on certain Navy ships) may be accommodated on a co-equal basis with the fixed and mobile services in the band 1761-1842 MHz. Specific frequencies required to be used at any location will be satisfied on a coordinated case-by-case basis. 47 C.F.R. § 2.106, footnote G42.

G42 The space operation service (Earth-to-space) is limited to the band 1761-1842 MHz, and is limited to space command, control, range and range rate systems.

NTIA states that these modifications are being made to the Federal Table based on the vital importance the space operation service provides in this frequency band to satellites operated by the U.S. Department of Defense. NTIA also states that the change from a footnote allocation to a table entry allocation will give this critical requirement the prominence and visibility that it requires. NTIA states that these modifications make no change with respect to the status between Federal and non-Federal allocations.

163. *Other Changes to United States Footnotes.* In the U.S. Table, we are taking the following seven actions with regard to United States footnotes. First, we are removing a reference to footnote US10 from the band 26480-26950 kHz because this footnote was deleted in the *Above 28 MHz Report and Order*.[296] Second, we are updating the contact information in footnote US81 by changing "Office of the Chief Engineer" to the "Office of Engineering and Technology." Third, we are correcting a typographical error in footnote US112 by changing "licale" to "locale." Fourth, we are deleting footnote US238 because the specified transition period has expired.[297] Fifth, we are adding a "*" to footnote US342 to indicate those RAS bands that are used for spectral line observations, and consequently, we are reinserting three segments (42.77-42.87 GHz, 43.07-43.17 GHz, and 43.37-43.47 GHz) within a frequency band (42.5-43.5 GHz) that is already listed in footnote US342.[298] Sixth, we are revising footnote US352 to delete the 14 sites in the band 1427-1432 MHz at which Federal operations have operated on a fully protected basis because the transition period has expired. Seventh, we are deleting footnote US264 from the band 47.2-48.2 GHz in the non-Federal Table because the footnote does not apply to this band.

164. *Other Changes to non-Federal (NG) Footnotes.* In the U.S. Table, we are taking the following five actions with regards to non-Federal footnotes. First, we are explicitly stating the frequency band to which footnote NG42 is applicable.[299] Accordingly, footnote NG42 is amended to read as follows:

NG42 In the band 10-10.5 GHz, non-Federal stations in the radiolocation service shall not cause harmful interference to the amateur service.

165. Second, we are deleting footnote NG129 because there are no fixed stations in Alaska listed in our licensing database for the band 76-100 MHz. Consequently, we are also deleting Sections 73.220(b) and 73.603(b) from the Commission's Rules. Third, we are revising footnote NG142 (TV stations authorized to operate on TV channels 2-69 may use a portion of their vertical blanking interval for the transmission of telecommunications signals) in order to remove the band 608-614 MHz ("TV channel 37") because it is not allocated to the broadcasting service.[300] Fourth, we are deleting footnote NG151 because licensees in the Cellular Radiotelephone Service have previously be authorized to provide fixed service on a primary basis and thus, there is no longer need for separate authority to provide

[296] Prior to its deletion, footnote US10 authorized the Civil Air Patrol to transmit on the frequency 26.62 MHz. *Above 28 MHz Report and Order*, 18 FCC Rcd at 23456, 23458, paras. 80 and 90.

[297] This action means that Federal stations are no longer permitted to operate in the band 1615-1705 kHz, except as specified in footnote US299.

[298] We take this action at the request of NTIA. *See* letter from Fredrick R. Wentland, Associate Administrator, Office of Spectrum Management, NTIA, to Mr. Edmond J. Thomas, Chief, OET, dated November 23, 2004.

[299] In the non-Federal Table, the band 10-10.5 GHz is allocated to the amateur and radiolocation services on a secondary basis and footnote NG42 is listed only in this band. 47 C.F.R. § 2.106.

[300] Specifically, we are amending 47 C.F.R. § 2.106, footnote NG142 by replacing the bands 470-512 MHz and 512-806 MHz with the bands 470-608 MHz and 614-806 MHz.

auxiliary services on a secondary basis. Fifth, we are capitalizing the word "license" in the fourth sentence in footnote NG169.

166. *Footnote Placement.* In the *1999 Table Clean-up Order*, we adopted the ITU's placement of footnote references in the U.S. Table.[301] Thus, footnote references which appear in the U.S. Table below the allocated service or services apply to more than one of the allocated services, or to the whole of the allocation concerned. Footnote references which appear to the right of a service are applicable only to that particular service. Our review finds that several footnotes that are applicable only to a particular service have not been placed to the right of that allocation. Accordingly, we take this opportunity to make the following conforming changes. In the Federal Table, we are placing footnote US214 to the right of the maritime mobile service in the band 157.0375-157.1875 MHz.[302]

167. In the non-Federal Table, we are placing the following footnotes to the right of the land mobile service: (1) NG4 and NG51 in the band 150.8-152.855 MHz;[303] (2) NG4 in the band 152.855-154 MHz; (3) US266 and NG111 in the band 157.1875-157.45 MHz;[304] (4) NG28 and NG111 in the band 157.45-161.575 MHz;[305] (5) NG6 in the band 161.625-161.775 MHz;[306] and (6) US266 and NG6 in the band 161.775-162.0125 MHz. In the non-Federal Table, we are placing the following footnotes to the right of the maritime mobile service: (1) US77, US106, US107, and NG117 in the band 156.2475-157.0375 MHz;[307] and (2) US77 in the band 161.575-161.625 MHz.

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[301] *See* ITU Radio Regulation Nos. 5.50 and 5.51. *1999 Table Clean-up Order*, 15 FCC Rcd at 3463, para. 5.

[302] Footnote US214 reads as follows: The frequency 157.1 MHz is the primary frequency for liaison communications between ship stations and stations of the United States Coast Guard. 47 C.F.R. § 2.106, footnote US214.

[303] Footnote NG4 reads as follows: The use of the frequencies in the band 152.84-153.38 MHz may be authorized, in any area, to remote pickup broadcast base and mobile stations on the condition that harmful interference will not be caused to stations operating in accordance with the Table of Frequency Allocations. Footnote NG51 reads as follows: In Puerto Rico and the Virgin Islands only, the bands 150.8-150.98 MHz and 150.98-151.49 MHz are allocated exclusively to the business radio service. 47 C.F.R. § 2.106, footnotes NG4 and NG51.

[304] Footnote NG111 reads as follows: The band 157.4375-157.4625 MHz may be used for one way paging operations in the special emergency radio service. 47 C.F.R. § 2.106, footnote NG111. See para. 151, *supra*, for revised footnote US266.

[305] Footnote NG28 reads as follows: The frequency band 160.86-161.40 MHz is available for assignment to remote pickup base and remote pickup mobile stations in Puerto Rico and the Virgin Islands only on a shared basis with the land transportation radio service. 47 C.F.R. § 2.106, footnote NG28.

[306] Footnote NG6 reads as follows: Stations in the public safety radio services authorized as of June 30, 1958, to use frequencies in the band 159.51-161.79 MHz in areas other than Puerto Rico and the Virgin Islands may continue such operation, including expansion of existing systems, on the condition that harmful interference will not be caused to stations in the services to which these bands are allocated. In Puerto Rico and the Virgin Islands this authority is limited to frequencies in the band 160.05-161.37 MHz. No new public radio service system will be authorized to operate on these frequencies. 47 C.F.R. § 2.106, footnote NG6.

[307] Footnote US106 reads as follows: The frequency 156.75 MHz is available for assignment to non-Government and Government stations for environmental communications in accordance with an agreed plan. Footnote US107reads as follows: The frequency 156.8 MHz is the national distress, safety and calling frequency for the maritime mobile VHF radiotelephone service for use by Government and non-Government ship and coast stations. Guard bands of 156.7625-156.7875 and 156.8125-156.8375 MHz are maintained. Footnote NG117 reads as follows: The frequency 156.050 and 156.175 MHz may be assigned to stations in the maritime mobile service for commercial and port operations in the New Orleans Vessel Traffic Service (VTS) area and the frequency 156.250 MHz may be assigned to stations in the maritime mobile service for port operating in the New Orleans and Houston VTS areas. 47 C.F.R. § 2.106, footnotes US106, US107, and NG117.

c. Updating the FCC Rule Part Cross References

168. If a frequency or frequency band has been allocated to a radiocommunication service in the non-Federal Table, then a cross reference may be added for the pertinent FCC Rule part (column 6 of § 2.106).[308] A staff review finds that the following cross references should be revised. Accordingly, we are adding a cross reference to: (1) Satellite Communications (Part 25) in the band 399.9-400.05 MHz, which is a Little LEO band;[309] (2) Experimental Radio, Auxiliary, Special Broadcast and Other Program Distribution Services (Part 74) in the band 157.45-161.575 MHz, a portion of which is available to remote pickup broadcast stations;[310] (3) Stations in the Maritime Services (Part 80) in the bands 156.2475-157.0375 MHz and 157.0375-157.1875 MHz, which are available for licensing under Section 80.373(f);[311] and (4) Private Land Mobile Radio Services (Part 90) in the bands 4750-4995 kHz, 5730-5900 kHz, 6765-7000 kHz, 9040-9400 kHz, 9900-9995 kHz, 10150-11175 kHz, 11400-11600 kHz, 12100-12230 kHz, 13410-13570 kHz, 13870-14000 kHz, 14350-14990 kHz, 15800-16360 KHz, 17410-17480 kHz, 18030-18068 kHz, 18168-18780 kHz, 19020-19680 kHz, 19800-19990 kHz, 20010-21000 kHz, 21850-21924 kHz, 22855-23200 kHz, and 23350-24890 kHz, which are available for licensing under Section 90.266;[312] and also in the band 406.1-410 MHz, which is available for licensing under Section 90.265(a).[313] In addition, we are deleting the cross reference to Aviation Services (Part 87) from the bands 5900-5950 kHz, 7300-7400 kHz, and 17480-17550 kHz.[314]

3. Parts 90 and 97

169. We are making editorial amendments to Parts 90 and 97 in order to correct and update these Rules. In Part 90 of the Commission's Rules, we are correcting a typographical error in the Public Safety Pool Frequency Table by changing the frequency "158.4725" MHz to "159.4725" MHz.[315] In Part 97 of the Commission's Rules, we updating and correcting paragraph (a) within Section 97.301 and various paragraphs within Section 97.303.

170. *Changes to the Amateur and AMSAT Bands Above 71 GHz.* We are revising Part 97 to reflect recent two Commission actions wherein the allocations in frequency bands above 71 GHz were realigned.[316] Table 3, below, depicts the allocation decisions that the Commission previously made in those proceedings with regards to the amateur service and the amateur-satellite (AMSAT) service.

[308] 47 C.F.R. § 2.105(d)(6).

[309] 47 C.F.R. § 25.202(a)(3).

[310] 47 C.F.R. § 74.402(b)(2).

[311] 47 C.F.R. § 80.373(f), which is titled "Frequencies in the 156-162 MHz band."

[312] These frequency bands are listed in a corrected *Public Notice* titled "2-25 MHz HF Frequency Bands Available for Part 90 Long Distance Communications," dated August 12, 1988, and are available for qualified Part 90 users for operations under Section 90.266. The WARC-92 HFBC bands are also listed in this *Public Notice*. We decline to add Part 90 cross references to the WARC-92 HFBC bands because after March 25, 2007, incumbent fixed and land mobile use will be authorized on the condition that harmful interference is not caused to the HFBC service and because new fixed and/or land mobile use will not be authorized. In addition, a *Public Notice* titled "Local Government Radio Service 2 to 10 MHz Frequency List" states that certain of the frequencies within the bands 2194-2495 kHz, 2505-2850 kHz, 5005-5450 kHz, and 7400-8100 kHz are available for use in accordance with Section 90.264. 47 C.F.R. §§ 90.264, 90.266.

[313] 47 C.F.R. § 90265(a).

[314] In para. 47, we deleted the unused aeronautical mobile service allocation from the bands 5900-5950 kHz and 7300-7400 kHz and the unused fixed service allocation from the band 17480-17550 kHz.

[315] See Appendix A, Section 90.20(c)(3).

[316] The Commission made these allocation changes in two proceedings: Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands; and Loea Communications Corporation Petition for Rulemaking, WT

(continued....)

Table 3: Changes to the Amateur and AMSAT Bands Above 71 GHz		
Band (GHz)	Decision	Remarks
75.5-76	Downgrade the primary amateur and AMSAT service allocations to secondary status and sunset these secondary allocations on January 1, 2006.	500 MHz reduction; see footnote US387.
119.98-120.02	Delete the secondary amateur service allocation.	40 MHz reduction.
122.25-123	Allocate to the amateur service on a secondary basis	Additional 750 MHz.
134-136	Allocate to the amateur and AMSAT services on a primary basis.	Additional 2 GHz; replaces the spectrum lost at 142-144 GHz.
136-141	Allocate to the amateur and AMSAT services on a secondary basis.	Additional 5 GHz; replaces the spectrum lost at 144-149 GHz.
142-144	Delete the primary amateur and AMSAT service allocations.	Reduction of 2 GHz.
144-149	Delete the secondary amateur and AMSAT service allocations.	Reduction of 5 GHz.

171. Most of the allocation changes shown in Table 3 have not been reflected in the service rules for the Amateur Radio Service. According, we are amending Section 97.301(a) to reflect the Commission's allocation action.[317] Specifically, we are revising the authorized frequency bands for a station having a control operator who has been granted a Technician, Technician Plus, General, Advanced, or Amateur Extra Class operator license by: (1) deleting the entry for 119.98-120.02 GHz; (2) adding an entry for 122.25-123 GHz; (3) adding an entry for 134-141 GHz; (4) deleting the entry for 142-149 GHz; and (5) changing the entry "above 300 GHz" to "above 275 GHz."[318]

(...continued from previous page)
Docket No. 02-146, *Report and Order*, 18 FCC Rcd 23318 (2003) (*Above 95 GHz Report and Order*); and Amendment of Part 2 of the Commission's Rules to Realign the 76-81 GHz band and the Frequency Range Above 95 GHz Consistent with International Allocation Changes and Amendment of Part 2 of the Commission's Rules to Allocate Additional Spectrum to the Inter-Satellite, Fixed, and Mobile Services and to Permit Unlicensed Devices to Use Certain Segments in the 50.2-50.4 GHz and 51.4-71.0 GHz Bands, ET Docket No. 03-102 and ET Docket No. 99-261, *Report and Order*, 19 FCC Rcd 3237 (2004).

[317] This amendment also applies to stations having a control operator who holds a CEPT radio-amateur license or IARP of any class. 47 C.F.R. § 97.301(a).

[318] In column 6 of the Table of Frequency Allocations, § 2.106, we are also adding a cross reference to Part 97 in the frequency range 275-1000 GHz. In the *Above 95 GHz Report and Order*, the Commission deleted the fixed and mobile service allocations from the band 275-300 GHz in order to align the U.S. Table with the ITU *Radio Regulations*. Thus, the frequency range 275-1000 GHz is labelled as "not allocated" in the U.S. Table. In addition, the Commission added international footnote 5.565 to the U.S. Table, which reads as follows: The frequency band 275-1000 GHz may be used by administrations for experimentation with, and development of, various active and passive services. In this band a need has been identified for the following spectral line measurements for passive services:

– radio astronomy service: 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;

– Earth exploration-satellite service (passive) and space research service (passive): 275-277 GHz, 294-306 GHz, 316-334 GHz, 342-349 GHz, 363-365 GHz, 371-389 GHz, 416-434 GHz, 442-444 GHz, 496-506 GHz, 546-568 GHz, 624-629 GHz, 634-654 GHz, 659-661 GHz, 684-692 GHz, 730-732 GHz, 851-853 GHz and 951-956 GHz.

Future research in this largely unexplored spectral region may yield additional spectral lines and continuum bands of interest to the passive services. Administrations are urged to take all practicable steps to protect these passive services from harmful interference until the date when the allocation Table is established in the above-mentioned frequency band.

172. In accordance with the Commission's realignment of the allocations above 71 GHz, we are also updating the frequency sharing requirements in Section 97.303.[319] Specifically, we are amending paragraphs (b), (c), and (h) by changing "77.0-77.5 GHz" and "144-149 GHz" to "76.0-77.5 GHz" and "136-141 GHz," respectively. In addition, we are updating the frequency bands listed in paragraph (k) (wherein no amateur station may cause harmful interference to the RAS, EESS (passive), and SRS (passive)) to list the frequency bands specified in footnote 5.565. In order to recognize that the band 77.5-78 GHz is allocated to the amateur and AMSAT services on a co-primary basis and that the primary radiolocation service allocation has been deleted from this band, we are amending paragraph (r) by removing paragraph (r)(2).[320]

173. *Additional Changes to Part 97.* Our review finds that additional changes should be made to Part 97 in order to reflect existing allocations and frequency sharing requirements. First, we take the following actions with regard to the band 1240-1300 MHz ("the 23 cm band"). We are amending Section 97.301(a) in order to correct the following typographical errors:[321] (1) the Region 3 entry is revised from "124-1300" MHz to "1240-1300" MHz; and (2) the cross reference to the frequency sharing requirements that are codified in Section 97.303 is revised from paragraph "(j)" to paragraph "(i)." In addition, we are amending Section 97.303(i) in order to reflect the current frequency sharing requirements in the 23 cm band.[322] The sharing frequency requirements in Section 97.303(i) do not accurately reflect the status of the Amateur Radio Service in the 23 cm band because this rule currently pertains to only the segment 1240-1260 MHz, and accordingly, we amend this Rule to conform to Section 2.106 (the Table of Frequency Allocations).[323] For consistency, we are moving the Federal and international frequency sharing requirements for the radiolocation service from Section 97.303(i) to Sections 97.303(b) (amateur frequency sharing requirements with the Federal radiolocation service) and 97.303(h) (amateur frequency sharing requirements with stations in the radiolocation service authorized by other nations).[324]

174. Second, we are taking the following actions with regard to the band 3.3-3.5 GHz ("the 9 cm band"). International footnote 5.431 states that the segment 3.4-3.475 GHz is allocated to the amateur service on a secondary basis in Germany, Israel and the United Kingdom.[325] Therefore, we are adding the segment 3.4-3.475 GHz to Section 97.301(a) as the authorized frequency band in Region 1. We are also adding a sentence to Section 97.303(l)(1) to recognize that the use of the segment 3.4-3.475 GHz is geographically limited. For consistency, we are moving the international frequency sharing requirement for the radiolocation service in the segment 3.3-3.4 GHz from Section 97.303(l)(3) to 97.303(h).[326] Accordingly, Section 97.303(l) is amended to read as follows:

[319] 47 C.F.R. § 97.303.

[320] Consequently, paragraph (r)(3) is renumbered as paragraph (r)(2).

[321] 47 C.F.R. § 97.301(a).

[322] 47 C.F.R. § 97.303(i).

[323] Currently, § 97.303(i) describes the frequency sharing requirements only for the segment 1240-1260 MHz. However, the entire 23 cm band is allocated to the ARNS, EESS (active), SRS (active), and radiolocation services on a co-primary basis for Federal use; and to the ARNS on a primary basis and to the amateur service on a secondary basis for non-Federal use. See 47 C.F.R. § 2.106.

[324] Consequently, we are adding paragraphs "b" and "h" to the sharing requirements in § 97.301(a) for the 23 cm band.

[325] See Appendix A, Section 2.106, footnote 5.431. At WRC-03, Nigeria was removed from footnote 5.431.

[326] Consequently, Section 97.303(l)(4) is renumbered as Section 97.303(l)(3).

(l) In the 9 cm band:

(1) In ITU Regions 2 and 3, the 9 cm band is allocated to the amateur service on a secondary basis. In ITU Region 1, the segment 3.4-3.475 GHz is allocated to the amateur service on a secondary basis for use only in Germany, Israel, and the United Kingdom.

(2) In the United States, the 9 cm band is allocated to the amateur and non-Federal radiolocation services on a secondary basis.

(3) In the 3.4-3.5 GHz segment, no amateur station shall cause harmful interference to, nor is protected from interference due to the operation of, stations in the fixed and fixed-satellite services.

Finally, in Section 97.301(a), we are correcting a typographical error in the authorized frequency band for Region 3. Specifically, the Region 3 entry is amended to read "3.3-3.5" GHz (instead of "3.3-.5" GHz).

175. Third, we are revising Section 97.303(a) in order to more closely parallel ITU Radio Regulation No. 4.8 (which is currently listed as "No. 386 (Geneva, 1979)" in our Rules). In addition, we are adding an informational phrase to explain that "services of the same category" is equivalent to services with the same allocation status. Specifically, Section 97.303(a) is revised to read as follows:

Where, in adjacent ITU Regions or sub-Regions, a band of frequencies is allocated to different services of the same category (i.e., primary or secondary allocations), the basic principle is the equality of right to operate. Accordingly, stations of each service in one Region or sub-Region must operate so as not to cause harmful interference to any service of the same or higher category in the other Regions or sub-Regions. (See ITU Radio Regulations, edition of 2004, No. 4.8.)

176. Fourth, we are revising Section 97.303(f)(4) by deleting duplicative information (space telecommand is a subset of the space operation service), by revising the 449.75-450.25 MHz segment in order to recognize that amateur stations are not authorized to transmit in the 450-450.25 MHz segment, and by correcting the spelling of the word "interference." Accordingly, Section 97.303(f)(4) will read as follows:

No amateur station transmitting in the 449.75-450.00 MHz segment shall cause interference to, nor is protected from interference due to the operation of stations in, the space operation and space research services.

177. Fifth, we are correcting a typographical error in Section 97.303(k). Specifically, we are listing the band 3.3458-3.3525 GHz ("3.3525" is currently shown as "3.525"), which is the frequency band that is listed in footnotes 5.149 and US342.[327]

V. PROCEDURAL MATTERS

A. Final Regulatory Flexibility Analysis

178. As required by the Regulatory Flexibility Act, *see* 5 U.S.C. § 604, the Commission has prepared a Final Regulatory Flexibility Analysis (FRFA) of the possible significant economic impact on small entities of the final rules adopted in this Report and Order. The FRFA is set forth in Appendix B.

B. Paperwork Reduction Act

179. This document does not contain information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. In addition, therefore, it does not contain any new or modified "information collection burden for small business concerns with fewer than 25 employees," pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, see 44 U.S.C. 3506(c)(4).

[327] 47 C.F.R. § 2.106, footnotes 5.149 and US342.

C. Congressional Review Act

180. The Commission will send a copy of this Report and Order in a report to be sent to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. § 801(a)(1)(A).

VI. ORDERING CLAUSES

181. Accordingly, IT IS ORDERED that pursuant to Sections 1, 4(i), 7(a), 301, 302(a), 303(c), 303(f), 303(g), 303(r), 307, 308, 316, and 332 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 151, 154(i), 157(a), 301, 302(a), 303(c), 303(f), 303(g), 303(r), 307, 308, 316, and 332, the REPORT AND ORDER is hereby ADOPTED.

182. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this REPORT AND ORDER, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

Appendix A: Final Rules

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 C.F.R. parts 2, 25, 73, 90, and 97 as follows:

PART 2 – FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

1. The authority citation for part 2 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

2. Section 2.1 is amended by revising paragraph (b) and by adding and revising the following terms in paragraph (c) in alphabetical order to read as follows:

§ 2.1 Terms and definitions.

(a) * * *

(b) The source of each definition is indicated as follows:
CS – Annex to the Constitution of the International Telecommunication Union (ITU).
CV – Annex to the Convention of the ITU.
FCC – Federal Communications Commission.
RR – ITU Radio Regulations.

(c) The following terms and definitions are issued:

* * * * *

Adaptive System. A radiocommunication system which varies its radio characteristics according to channel quality. (RR)

Administration. Any governmental department or service responsible for discharging the obligations undertaken in the Constitution of the International Telecommunication Union, in the Convention of the International Telecommunication Union and in the Administrative Regulations. (CS)

* * * * *

Broadcasting Service. A radiocommunication service in which the transmissions are intended for direct reception by the general public. This service may include sound transmissions, television transmissions or other types of transmission. (CS)

* * * * *

Coordinated Universal Time (UTC). Time scale, based on the second (SI), as defined in Recommendation ITU-R TF.460-6.

For most practical purposes associated with the ITU Radio Regulations, UTC is equivalent to mean solar time at the prime meridian (0° longitude), formerly expressed in GMT. (RR)

Coordination Area. When determining the need for coordination, the area surrounding an earth station sharing the same frequency band with terrestrial stations, or surrounding a transmitting earth station sharing the same bidirectionally allocated frequency band with receiving earth stations, beyond which the level of permissible interference will not be exceeded and coordination is therefore not required. (RR)

* * * * *

Coordination Distance. When determining the need for coordination, the distance on a given azimuth from an earth station sharing the same frequency band with terrestrial stations, or from a transmitting earth station sharing the same bidirectionally allocated frequency band with receiving earth stations,

beyond which the level of permissible interference will not be exceeded and coordination is therefore not required. (RR)

* * * * *

Facsimile. A form of telegraphy for the transmission of fixed images, with or without half-tones, with a view to their reproduction in a permanent form. (RR)

* * * * *

Frequency Assignment Subcommittee (FAS). A subcommittee of the Interdepartment Radio Advisory Committee (IRAC) within NTIA that develops and executes procedures for the assignment and coordination of Federal radio frequencies. (FCC)

* * * * *

Geostationary Satellite. A geosynchronous satellite whose circular and direct orbit lies in the plane of the Earth's equator and which thus remains fixed relative to the Earth; by extension, a geosynchronous satellite which remains approximately fixed relative to the Earth. (RR)

Government Master File (GMF). NTIA's database of Federal assignments. It also includes non-Federal authorizations coordinated with NTIA for the bands allocated for shared Federal and non-Federal use. (FCC)

* * * * *

Harmful Interference. Interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with [the ITU] Radio Regulations. (CS)

High Altitude Platform Station (HAPS). A station located on an object at an altitude of 20 to 50 km and at a specified, nominal, fixed point relative to the Earth. (RR)

* * * * *

Inclination of an Orbit (of an earth satellite). The angle determined by the plane containing the orbit and the plane of the Earth's equator measured in degrees between 0º and 180º and in counter-clockwise direction from the Earth's equatorial plane at the ascending node of the orbit. (RR)

* * * * *

Interdepartment Radio Advisory Committee (IRAC). A committee of the Federal departments, agencies, and administrations that advises NTIA in assigning frequencies to Federal radio stations and in developing and executing policies, programs, procedures, and technical criteria pertaining to the allocation, management, and use of the spectrum. The IRAC consists of a main committee, subcommittees, and several ad hoc groups that consider various aspects of spectrum management policy. The FCC serves as a member of the Frequency Assignment Subcommittee and as Liaison Representative on the main committee, all other subcommittees and ad hoc groups. (FCC)

International Telecommunication Union (ITU). An international organization within the United Nations System where governments and the private sector coordinate global telecom networks and services. The ITU is headquartered in Geneva, Switzerland and its internet address is www.itu.int. (FCC)

* * * * *

Mobile Service. A radiocommunication service between mobile and land stations, or between mobile stations. (CV)

* * * * *

National Telecommunications and Information Administration (NTIA). An agency of the United States Department of Commerce that serves as the President's principal advisor on telecommunications and information policy issues. NTIA manages Federal use of the radio spectrum and coordinates Federal use with the FCC. NTIA sets forth regulations for Federal use of the radio spectrum within its Manual of Regulations & Procedures for Federal Radio Frequency Management (NTIA Manual). (FCC)

* * * * *

Out-of-band domain (of an emission). The frequency range, immediately outside the necessary bandwidth but excluding the spurious domain, in which out-of-band emissions generally predominate. Out-of-band emissions, defined based on their source, occur in the out-of-band domain and, to a lesser extent, in the spurious domain. Spurious emissions likewise may occur in the out-of-band domain as well as in the spurious domain. (RR)

* * * * *

Permissible Interference.[2] Observed or predicted interference which complies with quantitative interference and sharing criteria contained in these [ITU Radio] Regulations or in ITU-R Recommendations or in special agreements as provided for in these Regulations. (RR)

* * * * *

Power. Whenever the power of a radio transmitter, etc. is referred to it shall be expressed in one of the following forms, according to the class of emission, using the arbitrary symbols indicated:

– peak envelope power (PX or pX);
– mean power (PY or pY);
– carrier power (PZ or pZ).

NOTE 1: For different classes of emission, the relationships between peak envelope power, mean power and carrier power, under the conditions of normal operation and of no modulation, are contained in ITU-R Recommendations which may be used as a guide.

NOTE 2: For use in formulae, the symbol p denotes power expressed in watts and the symbol P denotes power expressed in decibels relative to a reference level. (RR)

* * * * *

Public Correspondence. Any telecommunication which the offices and stations must, by reason of their being at the disposal of the public, accept for transmission. (CS)

* * * * *

Radio. A general term applied to the use of radio waves. (RR)

* * * * *

Radiocommunication. Telecommunication by means of radio waves. (CS) (CV)

* * * * *

Safety Service. Any radiocommunication service used permanently or temporarily for the safeguarding of human life and property. (RR)

* * * * *

[1] * * *

[2] See footnote under Accepted Interference.

Semi-Duplex Operation. A method which is simplex operation on one end of the circuit and duplex operation at the other.[4] (RR)

* * * * *

Simplex Operation. Operating method in which transmission is made possible alternatively in each direction of a telecommunication channel, for example, by means of manual control.[5]

* * * * *

Spurious domain (of an emission): The frequency range beyond the out-of-band domain in which spurious emissions generally predominate. (RR)

* * * * *

Telecommunication. Any transmission, emission or reception of signs, signals, writings, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems. (CS)

* * * * *

Telegram. Written matter intended to be transmitted by telegraphy for delivery to the addressee. This term also includes radiotelegrams unless otherwise specified. (CS)

Note: In this definition the term telegraphy has the same general meaning as defined in the Convention.

Telegraphy.[6] A form of telecommunication in which the transmitted information is intended to be recorded on arrival as a graphic document; the transmitted information may sometimes be presented in an alternative form or may be stored for subsequent use. (CS)

Telemetry. The use of telecommunication for automatically indicating or recording measurements at a distance from the measuring instrument. (RR)

Telephony. A form of telecommunication primarily intended for the exchange of information in the form of speech. (CS)

* * * * *

3. Section 2.100 is revised to read as follows:

§ 2.100 International regulations in force.

The ITU Radio Regulations, edition of 2004, have been incorporated to the extent practicable in Subparts A and B of this part.

4. Section 2.101 is revised to read as follows:

§ 2.101 Frequency and wavelength bands.

The radio spectrum shall be subdivided into nine frequency bands, which shall be designated by progressive whole numbers in accordance with the following table. As the unit of frequency is the hertz (Hz), frequencies shall be expressed:

– in kilohertz (kHz), up to and including 3 000 kHz;

– in megahertz (MHz), above 3 MHz, up to and including 3 000 MHz;

[3] * * *

[4] See footnote under Duplex Operations.

[5] See footnote under Duplex Operation.

[6] A graphic document records information in a permanent form and is capable of being filed and consulted; it may take the form of written or printed matter or of a fixed image.

– in gigahertz (GHz), above 3 GHz, up to and including 3 000 GHz.

However, where adherence to these provisions would introduce serious difficulties, for example in connection with the notification and registration of frequencies, the lists of frequencies and related matters, reasonable departures may be made.

Band number	Symbols	Frequency range (lower limit exclusive, upper limit inclusive)	Corresponding metric subdivision	Metric abbreviations for the bands
4	VLF	3 to 30 kHz	Myriametric waves	B.Mam
5	LF	30 to 300 kHz	Kilometric waves	B.km
6	MF	300 to 3 000 kHz	Hectometric waves	B.hm
7	HF	3 to 30 MHz	Decametric waves	B.dam
8	VHF	30 to 300 MHz	Metric waves	B.m
9	UHF	300 to 3 000 MHz	Decimetric waves	B.dm
10	SHF	3 to 30 GHz	Centimetric waves	B.cm
11	EHF	30 to 300 GHz	Millimetric waves	B.mm
12		300 to 3 000 GHz	Decimillimetric waves	

NOTE 1: "Band N" (N = band number) extends from 0.3×10^N Hz to 3×10^N Hz.

NOTE 2: Prefix: k = kilo (10^3), M = mega (10^6), G = giga (10^9).

In communications between administrations and the ITU, no names, symbols or abbreviations should be used for the various frequency bands other than those specified in this section.

5. Section 2.102 is amended by revising paragraphs (a), (b)(3), (c) introductory text, (c)(1), (c)(3), (c)(4), (e), (g), and (h) introductory text.

§ 2.102 Assignment of frequencies.

(a) Except as otherwise provided in this section, the assignment of frequencies and bands of frequencies to all stations and classes of stations and the licensing and authorizing of the use of all such frequencies between 9 kHz and 275 GHz, and the actual use of such frequencies for radiocommunication or for any other purpose, including the transfer of energy by radio, shall be in accordance with the Table of Frequency Allocations in § 2.106.

(b) * * *

* * * * *

(3) Experimental stations, pursuant to part 5, may be authorized the use of any frequency or frequency band not exclusively allocated to the passive services (including the radio astronomy service).

* * * * *

(c) Non-Federal stations may be authorized to use Federal frequencies in the bands above 25 MHz if the Commission finds, after consultations with the appropriate Federal agency or agencies, that such use is necessary for coordination of Federal and non-Federal activities: Provided, however, that:

(1) Non-Federal operation on Federal frequencies shall conform with the conditions agreed upon by the Commission and NTIA (the more important of which are contained in paragraphs (c) (2), (3), and (4) of this section);

* * * * *

(3) Such operations shall not cause harmful interference to Federal stations and, should harmful interference result, that the interfering non-Federal operation shall immediately terminate; and

(4) Non-Federal operation has been certified as necessary by the Federal agency involved and this certification has been furnished, in writing, to the non-Federal licensee with which communication is required.

* * * * *

(e) Non-Federal services operating on frequencies in the band 25-50 MHz must recognize that it is shared with various services of other countries; that harmful interference may be caused by skywave signals received from distant stations of all services of the United States and other countries radiating power on frequencies in this band; and that no protection from such harmful interference generally can be expected. Persons desiring to avoid such harmful interference should consider operation on available frequencies higher in the radio spectrum not generally subject to this type of difficulty.

* * * * *

(g) In the bands above 25 MHz which are allocated to the non-Federal land mobile service, fixed stations may be authorized on the following conditions:

* * * * *

(h) Special provisions regarding the use of spectrum allocated to the fixed and land mobile services below 25 MHz by non-Federal stations.

* * * * *

6. Section 2.103 is amended by revising paragraphs (a) introductory text, (a)(1), (a)(3), (a)(4), and (b).

§ 2.103 Federal use of non-Federal frequencies.

(a) Federal stations may be authorized to use non-Federal frequencies in the bands above 25 MHz (except the 764-776 MHz and 794-806 MHz public safety bands) if the Commission finds that such use is necessary for coordination of Federal and non-Federal activities: Provided, however, that:

(1) Federal operation on non-Federal frequencies shall conform with the conditions agreed upon by the Commission and NTIA (the more important of which are contained in paragraphs (a)(2), (a)(3) and (a)(4) of this section);

* * * * *

(3) Such operations shall not cause harmful interference to non-Federal stations and, should harmful interference result, that the interfering Federal operation shall immediately terminate; and

(4) Federal operation has been certified as necessary by the non-Federal licensees involved and this certification has been furnished, in writing, to the Federal agency with which communication is required.

(b) Federal stations may be authorized to use channels in the 764-776 MHz, 794-806 MHz and 4940-4990 MHz public safety bands with non-Federal entities if the Commission finds such use necessary; where:

(1) The stations are used for interoperability or part of a Federal/non-Federal shared or joint-use system;

(2) The Federal entity obtains the approval of the non-Federal (State/local government) licensee(s) or applicant(s) involved;

(3) Federal operation is in accordance with the Commission's Rules governing operation of this band and conforms with any conditions agreed upon by the Commission and NTIA; and

(4) Interoperability, shared or joint-use systems are the subject of a mutual agreement between the Federal and non-Federal entities. This section does not preclude other arrangements or agreements as permitted under part 90 of the rules. See 47 CFR §§ 90.179 and 90.421 of this chapter.

7. Section 2.104 is amended by revising paragraphs (b)(1), (b)(3), (c)(2), (c)(4)(ii)(B), (c)(4)(iii), (g), and (h)(5).

§ 2.104 International Table of Frequency Allocations.

* * * * *

(b) * * *

(1) Region 1. Region 1 includes the area limited on the east by line A (lines A, B and C are defined below) and on the west by line B, excluding any of the territory of the Islamic Republic of Iran which lies between these limits. It also includes the whole of the territory of Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Turkey and Ukraine and the area to the north of the Russian Federation which lies between lines A and C.

* * * * *

(3) Region 3. Region 3 includes the area limited on the east by line C and on the west by line A, except any of the territory of Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Turkey and Ukraine and the area to the north of the Russian Federation. It also includes that part of the territory of the Islamic Republic of Iran lying outside of those limits.

* * * * *

(c) * * *

* * * * *

(2) The "European Broadcasting Area" is bounded on the west by the western boundary of Region 1, on the east by the meridian 40° East of Greenwich and on the south by the parallel 30° North so as to include the northern part of Saudi Arabia and that part of those countries bordering the Mediterranean within these limits. In addition, Iraq, Jordan and that part of the territory of the Syrian Arab Republic, Turkey and Ukraine lying outside the above limits are included in the European Broadcasting Area.

* * * * *

(4) * * *

* * * * *

(ii) * * *

* * * * *

(B) That part of Libyan Arab Jamahiriya north of parallel 30° North.

(iii) In Region 2, the Tropical Zone may be extended to parallel 33° North, subject to special agreements between the countries concerned in that Region (see Article 6 of the ITU Radio Regulations).

* * * * *

(g) Miscellaneous provisions. (1) Where it is indicated in the International Table that a service or stations in a service may operate in a specific frequency band subject to not causing harmful interference to another service or to another station in the same service, this means also that the service which is subject to not causing harmful interference cannot claim protection from harmful interference caused by the other service or other station in the same service.

(2) Where it is indicated in the International Table that a service or stations in a service may operate in a specific frequency band subject to not claiming protection from another service or from another station in the same service, this means also that the service which is subject to not claiming protection shall not cause harmful interference to the other service or other station in the same service.

(3) Except if otherwise specified in a footnote, the term "fixed service", where appearing in the International Table, does not include systems using ionospheric scatter propagation.

(h) * * *

* * * * *

(5) The footnote references which appear in the International Table below the allocated service or services apply to more than one of the allocated services, or to the whole of the allocation concerned.

* * * * *

8. Section 2.105 is amended by revising paragraph (a) and associated notes 1-4; by revising paragraph (b) and associated note 7; by revising paragraphs (c)(1) introductory text, (d)(1), (d)(2), (d)(3), (d)(5)(i), (d)(5)(ii), (d)(5)(iii), and (d)(5)(iv); by removing paragraph (d)(6); and by adding paragraphs (e) and (f) to read as follows:

§ 2.105 United States Table of Frequency Allocations.

(a) The United States Table of Frequency Allocations (United States Table) is subdivided into the Federal Table of Frequency Allocations (Federal Table, column 4 of § 2.106) and the non-Federal Table of Frequency Allocations (non-Federal Table, column 5 of § 2.106). The United States Table is based on the Region 2 Table because the relevant area of jurisdiction is located primarily in Region 2[1] (i.e., the 50 States, the District of Columbia, the Caribbean insular areas,[2] and some of the Pacific insular areas).[3] [4] The Federal Table is administered by NTIA[5] and the non-Federal Table is administered by the Federal Communications Commission (FCC).[6]

(b) In the United States, radio spectrum may be allocated to either Federal or non-Federal use exclusively, or for shared use. In the case of shared use, the type of service(s) permitted need not be the same [e.g., Federal FIXED, non-Federal MOBILE]. The terms used to designate categories of services and allocations[7] in columns 4 and 5 of § 2.106 correspond to the terms in the ITU Radio Regulations.

(c) Category of services. (1) Any segment of the radio spectrum may be allocated to the Federal and/or non-Federal sectors either on an exclusive or shared basis for use by one or more radio services. In the case where an allocation has been made to more than one service, such services are listed in the following order:

* * * * *

(d) Format of the United States Table. (1) The frequency band referred to in each allocation, column 4 for Federal operations and column 5 for non-Federal operations, is indicated in the left-hand top corner of the column. If there is no service or footnote indicated for a band of frequencies in column 4, then the Federal sector has no access to that band except as provided for by § 2.103. If there is no service or footnote indicated for a band of frequencies in column 5, then the non-Federal sector has no access to that band except as provided for by § 2.102.

---

[1] See § 2.104(b) for definitions of the ITU Regions.

[2] The Caribbean insular areas are Puerto Rico, the United States Virgin Islands, and Navassa Island.

[3] The Pacific insular areas located in Region 2 are Johnston Atoll and Midway Atoll.

[4] The operation of stations in the Pacific insular areas located in Region 3 are generally governed by the Region 3 Table (i.e., column 3 of §2.106). The Pacific insular areas located in Region 3 are American Samoa, Guam, the Northern Mariana Islands, Baker Island, Howland Island, Jarvis Island, Kingman Reef, Palmyra Island, and Wake Island.

[5] * * *

[6] * * *

[7] The radio services are defined in § 2.1.

(2) When the Federal Table and the non-Federal Table are exactly the same for a shared band, the line between columns 4 and 5 is deleted and the allocations are shown once.

(3) The Federal Table, given in column 4, is included for informational purposes only.

* * * * *

(5) * * *

(i) Any footnote consisting of "5." followed by one or more digits, e.g., 5.53, denotes an international footnote. Where an international footnote is applicable, without modification, to both Federal and non-Federal operations, the Commission places the footnote in both the Federal Table and the non-Federal Table (columns 4 and 5) and the international footnote is binding on both Federal users and non-Federal licensees. If, however, an international footnote pertains to a service allocated only for Federal or non-Federal use, the international footnote will be placed only in the affected Table. For example, footnote 5.142 pertains only to the amateur service, and thus, footnote 5.142 is shown only in the non-Federal Table.

(ii) Any footnote consisting of the letters "US" followed by one or more digits, e.g., US7, denotes a stipulation affecting both Federal and non-Federal operations. United States footnotes appear in both the Federal Table and the non-Federal Table.

(iii) Any footnote consisting of the letters "NG" followed by one or more digits, e.g., NG2, denotes a stipulation applicable only to non-Federal operations. Non-Federal footnotes appear solely in the non-Federal Table (column 5).

(iv) Any footnote consisting of the letter "G" following by one or more digits, e.g., G2, denotes a stipulation applicable only to Federal operations. Federal footnotes appear solely in the Federal Table (column 4).

(e) Rule Part Cross References. If a frequency or frequency band has been allocated to a radiocommunication service in the non-Federal Table, then a cross reference may be added for the pertinent FCC Rule part (column 6 of §2.106). For example, the band 849-851 MHz is allocated to the aeronautical mobile service for non-Federal use, rules for the use of the 849–851 MHz band have been added to Part 22—Public Mobile Services (47 CFR part 22), and a cross reference, Public Mobile (22), has been added in column 6 of § 2.106. The exact use that can be made of any given frequency or frequency band (e.g., channelling plans, allowable emissions, etc.) is given in the FCC Rule part(s) so indicated. The FCC Rule parts in this column are not allocations and are provided for informational purposes only. This column also may contain explanatory notes for informational purposes only.

(f) The Commission updates § 2.106 shortly after a final rule that revises that section is released. The address for the FCC Radio Spectrum Home Page, which includes the FCC Online Table of Frequency Allocations and the FCC Allocation History File, is www. http://www.fcc.gov/oet/spectrum/.

9. Section 2.106, the Table of Frequency Allocations, is amended as follows:

a. Revise all pages.

b. In the list of International footnotes, revise footnotes 5.56, 5.58, 5.68, 5.70, 5.79A, 5.82, 5.87, 5.96, 5.98, 5.99, 5.107, 5.112, 5.114, 5.117, 5.118, 5.134, 5.136, 5.139, 5.140, 5.142, 5.143, 5.146, 5.151, 5.152, 5.154, 5.155, 5.163, 5.164, 5.174, 5.177, 5.179, 5.181, 5.203B, 5.204, 5.210, 5.212, 5.221, 5.237, 5.254, 5.262, 5.271, 5.273, 5.277, 5.287, 5.288, 5.294, 5.296, 5.311, 5.312, 5.316, 5.323, 5.328A, 5.329, 5.330, 5.331, 5.334, 5.338, 5.345, 5.347, 5.348, 5.348A, 5.351A, 5.355, 5.359, 5.362B, 5.369, 5.381, 5.382, 5.386, 5.387, 5.388A, 5.395, 5.396, 5.400, 5.416, 5.418, 5.418A, 5.418B, 5.418C, 5.422, 5.428, 5.429, 5.430, 5.431, 5.443B, 5.444, 5.444A, 5.447E, 5.453, 5.454, 5.455, 5.456, 5.457A, 5.460, 5.466, 5.468, 5.469, 5.473, 5.477, 5.478, 5.481, 5.482, 5.483, 5.494, 5.495, 5.500, 5.501, 5.502, 5.503, 5.504C, 5.505, 5.506A, 5.506B, 5.508, 5.508A, 5.509A, 5.512, 5.514, 5.516B, 5.521, 5.530, 5.536A, 5.537A, 5.538, 5.543A, 5.545, 5.546, 5.547C, 5.548, 5.549, 5.550, 5.551I, and 5.552A; add footnotes 5.138A, 5.141A, 5.141B, 5.141C, 5.143A, 5.143B, 5.143C, 5.143D, 5.143E, 5.256A, 5.279A, 5.339A, 5.347A, 5.348B, 5.348C, 5.379B, 5.379C, 5.379D,

5.379E, 5.380A, 5.388B, 5.417A, 5.417B, 5.417C, 5.417D, 5.424A, 5.516A, 5.536C, 5.549A, and 5.555B; and remove footnotes 5.377, 5.389D, 5.421, 5.443A, 5.467, 5.503A, 5.534, 5.551A, and 5.555A.

c. In the list of United States (US) footnotes, revise footnotes US18, US25, US32, US41, US44, US48, US49, US50, US51, US53, US58, US74, US77, US80, US81, US82, US87, US104, US106, US107, US108, US110, US112, US116, US209, US210, US217, US218, US220, US224, US225, US229, US230, US231, US240, US244, US252, US258, US262, US266, US268, US275, US281, US282, US283, US296, US298, US300, US303, US310, US316, US319, US320, US321, US324, US325, US334, US335, US339, US340, US342, US344, US347, US348, US349, US350, US351, US352, US359, US360, US361, US362, US366, US367, US368, US378, US380, US382, US384, US389, US390, and US391; remove footnotes US238, US370, US385, and US386; and add footnotes US394, US395, US396, US397, and US398.

d. In the list of non-Federal Government (NG) footnotes, revise footnotes NG42, NG134, NG142, NG152, NG160, and NG169; and remove footnotes NG129, NG151, and NG176.

e. In the list of Federal Government (G) footnotes, revise footnotes G2, G8, G11, G31, G32, G42, G56, G59, G110, G117, G118, G123, G124, G129, G130, G131; and add footnotes G132 and G133.

§ 2.106 Table of Frequency Allocations.

The revisions and additions read as follows:

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International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
Below 9 (Not Allocated) 5.53 5.54			Below 9 (Not Allocated) 5.53 5.54		
9-14 RADIONAVIGATION			9-14 RADIONAVIGATION US18 US294		
14-19.95 FIXED MARITIME MOBILE 5.57 5.55 5.56			14-19.95 FIXED MARITIME MOBILE 5.57 US294	14-19.95 Fixed US294	
19.95-20.05 STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)			19.95-20.05 STANDARD FREQUENCY AND TIME SIGNAL (20 kHz) US294		
20.05-70 FIXED MARITIME MOBILE 5.57			20.05-59 FIXED MARITIME MOBILE 5.57 US294	20.05-59 FIXED US294	
			59-61 STANDARD FREQUENCY AND TIME SIGNAL (60 kHz) US294		
			61-70 FIXED MARITIME MOBILE 5.57 US294	61-70 FIXED US294	
5.56 5.58					
70-72 RADIONAVIGATION 5.60 5.56	70-90 FIXED MARITIME MOBILE 5.57 MARITIME RADIONAVIGATION 5.60 Radiolocation	70-72 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59	70-90 FIXED MARITIME MOBILE 5.57 Radiolocation	70-90 FIXED Radiolocation	Private Land Mobile (90)
72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60 5.56		72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60			
84-86 RADIONAVIGATION 5.60		84-86 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59			
86-90 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.56	5.61	86-90 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60	US294	US294	

90-110 RADIONAVIGATION 5.62 Fixed 5.64			90-110 RADIONAVIGATION 5.62 US18 US104 US294	Aviation (87) Private Land Mobile (90)
110-112 FIXED MARITIME MOBILE RADIONAVIGATION 5.64	110-130 FIXED MARITIME MOBILE MARITIME RADIONAVIGATION 5.60 Radiolocation	110-112 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	110-130 FIXED MARITIME MOBILE Radiolocation	Maritime (80) Private Land Mobile (90)
112-115 RADIONAVIGATION 5.60		112-117.6 RADIONAVIGATION 5.60 Fixed Maritime mobile		
115-117.6 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.64 5.66		 5.64 5.65		
117.6-126 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64		117.6-126 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64		
126-129 RADIONAVIGATION 5.60		126-129 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.64 5.65		
129-130 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	 5.61 5.64	129-130 FIXED MARITIME MOBILE RADIONAVIGATION 5.60 5.64	 5.64 US294	
130-148.5 FIXED MARITIME MOBILE 5.64 5.67	130-160 FIXED MARITIME MOBILE 5.64	130-160 FIXED MARITIME MOBILE RADIONAVIGATION 5.64	130-160 FIXED MARITIME MOBILE 5.64 US294	Maritime (80)
148.5-255 BROADCASTING	160-190 FIXED	160-190 FIXED Aeronautical radionavigation	160-190 FIXED MARITIME MOBILE US294 / 160-190 FIXED US294	Aviation (87)
	190-200 AERONAUTICAL RADIONAVIGATION		190-200 AERONAUTICAL RADIONAVIGATION US18 US226 US294	
5.68 5.69 5.70	200-275 AERONAUTICAL RADIONAVIGATION Aeronautical mobile	200-285 AERONAUTICAL RADIONAVIGATION Aeronautical mobile	200-275 AERONAUTICAL RADIONAVIGATION US18 Aeronautical mobile US294	
255-283.5 BROADCASTING AERONAUTICAL RADIONAVIGATION 5.70 5.71				

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
See previous page for 255-283.5 kHz	275-285	See previous page for 200-285 kHz	275-285		
283.5-315 AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73	AERONAUTICAL RADIONAVIGATION Aeronautical mobile Maritime radionavigation (radiobeacons)		AERONAUTICAL RADIONAVIGATION Aeronautical mobile Maritime radionavigation (radiobeacons) US18 US294		Aviation (87)
5.72 5.74	285-315 AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73		285-325 MARITIME RADIONAVIGATION (radiobeacons) 5.73 Aeronautical radionavigation (radiobeacons)		
315-325 AERONAUTICAL RADIONAVIGATION Maritime radionavigation (radiobeacons) 5.73 5.72 5.75	315-325 MARITIME RADIONAVIGATION (radiobeacons) 5.73 Aeronautical radionavigation	315-325 AERONAUTICAL RADIONAVIGATION MARITIME RADIONAVIGATION (radiobeacons) 5.73	US18 US294 US364		
325-405 AERONAUTICAL RADIONAVIGATION	325-335 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Maritime radionavigation (radiobeacons)	325-405 AERONAUTICAL RADIONAVIGATION Aeronautical mobile	325-335 AERONAUTICAL RADIONAVIGATION (radiobeacons) Aeronautical mobile Maritime radionavigation (radiobeacons) US18 US294		
5.72	335-405 AERONAUTICAL RADIONAVIGATION Aeronautical mobile		335-405 AERONAUTICAL RADIONAVIGATION (radiobeacons) US18 Aeronautical mobile US294		
405-415 RADIONAVIGATION 5.76 5.72	405-415 RADIONAVIGATION 5.76 Aeronautical mobile		405-415 RADIONAVIGATION 5.76 US18 Aeronautical mobile US294		Maritime (80) Aviation (87)
415-435 MARITIME MOBILE 5.79 AERONAUTICAL RADIONAVIGATION 5.72	415-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.80		415-435 MARITIME MOBILE 5.79 AERONAUTICAL RADIONAVIGATION US294		
435-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.72 5.82	5.77 5.78 5.82		435-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.82 US231 US294	435-495 MARITIME MOBILE 5.79 5.79A 5.82 US231 US294	Maritime (80)
495-505 MOBILE (distress and calling) 5.83			495-505 MOBILE (distress and calling) 5.83		Maritime (80) Aviation (87)

505-526.5 MARITIME MOBILE 5.79 5.79A 5.84 AERONAUTICAL RADIONAVIGATION 5.72	505-510 MARITIME MOBILE 5.79 510-525 MOBILE 5.79A 5.84 AERONAUTICAL RADIONAVIGATION 525-535	505-526.5 MARITIME MOBILE 5.79 5.79A 5.84 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Land mobile	505-510 MARITIME MOBILE 5.79 510-525 MARITIME MOBILE (ships only) 5.79A 5.84 AERONAUTICAL RADIONAVIGATION (radiobeacons) US18 US14 US225 525-535		Maritime (80) Maritime (80) Aviation (87)
526.5-1606.5 BROADCASTING	BROADCASTING 5.86 AERONAUTICAL RADIONAVIGATION	526.5-535 BROADCASTING Mobile 5.88	AERONAUTICAL RADIONAVIGATION (radiobeacons) US18 MOBILE US221 US239		Aviation (87) Private Land Mobile (90)
5.87 5.87A	535-1605 BROADCASTING 1605-1625 BROADCASTING 5.89	535-1606.5 BROADCASTING	535-1605 US321 1605-1615 MOBILE US221 US321	535-1605 BROADCASTING US321 NG128 1605-1705 BROADCASTING 5.89	Radio Broadcast (AM) (73) Auxiliary Broadcast (74) Alaska Fixed (80)
1606.5-1625 FIXED MARITIME MOBILE 5.90 LAND MOBILE 5.92	5.90	1606.5-1800 FIXED MOBILE RADIOLOCATION RADIONAVIGATION	1615-1705 US299 US321	US299 US321 NG128	
1625-1635 RADIOLOCATION 5.93	1625-1705 FIXED MOBILE BROADCASTING 5.89 Radiolocation				
1635-1800 FIXED MARITIME MOBILE 5.90 LAND MOBILE	5.90 1705-1800 FIXED MOBILE RADIOLOCATION AERONAUTICAL RADIONAVIGATION		1705-1800 FIXED MOBILE RADIOLOCATION US240		Maritime (80) Private Land Mobile (90)
5.92 5.96		5.91			
1800-1810 RADIOLOCATION 5.93	1800-1850 AMATEUR	1800-2000 AMATEUR FIXED MOBILE except aeronautical mobile RADIONAVIGATION Radiolocation	1800-1900	1800-1900 AMATEUR	Amateur (97)
1810-1850 AMATEUR 5.98 5.99 5.100 5.101					
1850-2000 FIXED MOBILE except aeronautical mobile	1850-2000 AMATEUR FIXED MOBILE except aeronautical mobile RADIOLOCATION RADIONAVIGATION		1900-2000 RADIOLOCATION US290		Private Land Mobile (90) Amateur (97)
5.92 5.96 5.103	5.102	5.97			

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
2000-2025 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103	2000-2065 FIXED MOBILE		2000-2065 FIXED MOBILE	2000-2065 MARITIME MOBILE NG19	Maritime (80)
2025-2045 FIXED MOBILE except aeronautical mobile (R) Meteorological aids 5.104 5.92 5.103					
2045-2160 FIXED MARITIME MOBILE LAND MOBILE 5.92	2065-2107 MARITIME MOBILE 5.105 5.106		US340 2065-2107 MARITIME MOBILE 5.105 US296 US340	US340	
2160-2170 RADIOLOCATION 5.93 5.107	2107-2170 FIXED MOBILE		2107-2170 FIXED MOBILE US340	2107-2170 FIXED LAND MOBILE MARITIME MOBILE NG19 US340	Maritime (80) Private Land Mobile (90)
2170-2173.5 MARITIME MOBILE			2170-2173.5 MARITIME MOBILE (telephony) US340	2170-2173.5 MARITIME MOBILE US340	Maritime (80)
2173.5-2190.5 MOBILE (distress and calling) 5.108 5.109 5.110 5.111			2173.5-2190.5 MOBILE (distress and calling) 5.108 5.109 5.110 5.111 US279 US340		Maritime (80) Aviation (87)
2190.5-2194 MARITIME MOBILE			2190.5-2194 MARITIME MOBILE (telephony) US340	2190.5-2194 MARITIME MOBILE US340	Maritime (80)
2194-2300 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103 5.112	2194-2300 FIXED MOBILE 5.112		2194-2495 FIXED MOBILE	2194-2495 FIXED LAND MOBILE MARITIME MOBILE NG19	Maritime (80) Aviation (87) Private Land Mobile (90)
2300-2498 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113 5.103	2300-2495 FIXED MOBILE BROADCASTING 5.113		US340	US340	
2498-2501 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)	2495-2501 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz)		2495-2501 STANDARD FREQUENCY AND TIME SIGNAL (2500 kHz) US340		
2501-2502 STANDARD FREQUENCY AND TIME SIGNAL Space research			2501-2502 STANDARD FREQUENCY AND TIME SIGNAL US340 G106	2501-2502 STANDARD FREQUENCY AND TIME SIGNAL US340	

2502-2625 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103 5.114	2502-2505 STANDARD FREQUENCY AND TIME SIGNAL	2502-2505 STANDARD FREQUENCY AND TIME SIGNAL US340		
2625-2650 MARITIME MOBILE MARITIME RADIONAVIGATION 5.92	2505-2850 FIXED MOBILE	2505-2850 FIXED MOBILE	2505-2850 FIXED LAND MOBILE MARITIME MOBILE	Maritime (80) Aviation (87) Private Land Mobile (90)
2650-2850 FIXED MOBILE except aeronautical mobile (R) 5.92 5.103		US285 US340	US285 US340	
2850-3025 AERONAUTICAL MOBILE (R) 5.111 5.115		2850-3025 AERONAUTICAL MOBILE (R) 5.111 5.115 US283 US340		Aviation (87)
3025-3155 AERONAUTICAL MOBILE (OR)		3025-3155 AERONAUTICAL MOBILE (OR) US340		
3155-3200 FIXED MOBILE except aeronautical mobile (R) 5.116 5.117		3155-3230 FIXED MOBILE except aeronautical mobile (R)		Maritime (80) Private Land Mobile (90)
3200-3230 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113 5.116		US340		
3230-3400 FIXED MOBILE except aeronautical mobile BROADCASTING 5.113 5.116 5.118		3230-3400 FIXED MOBILE except aeronautical mobile Radiolocation US340		Maritime (80) Aviation (87) Private Land Mobile (90)
3400-3500 AERONAUTICAL MOBILE (R)		3400-3500 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
3500-3800 AMATEUR FIXED MOBILE except aeronautical mobile 5.92	3500-3750 AMATEUR 5.119	3500-3900 AMATEUR FIXED MOBILE	3500-4000	3500-4000 AMATEUR	Amateur (97)
3800-3900 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	3750-4000 AMATEUR FIXED MOBILE except aeronautical mobile (R)				
3900-3950 AERONAUTICAL MOBILE (OR) 5.123		3900-3950 AERONAUTICAL MOBILE BROADCASTING			
3950-4000 FIXED BROADCASTING 5.122 5.125		3950-4000 FIXED BROADCASTING 5.126	US340	US340	
4000-4063 FIXED MARITIME MOBILE 5.127 5.126			4000-4063 FIXED MARITIME MOBILE US340		Maritime (80)
4063-4438 MARITIME MOBILE 5.79A 5.109 5.110 5.130 5.131 5.132 5.128 5.129			4063-4438 MARITIME MOBILE 5.79A 5.109 5.110 5.130 5.131 5.132 US82 US296 US340		Maritime (80) Aviation (87)
4438-4650 FIXED MOBILE except aeronautical mobile (R)		4438-4650 FIXED MOBILE except aeronautical mobile	4438-4650 FIXED MOBILE except aeronautical mobile (R) US340		Maritime (80) Aviation (87) Private Land Mobile (90)
4650-4700 AERONAUTICAL MOBILE (R)			4650-4700 AERONAUTICAL MOBILE (R) US282 US283 US340		Aviation (87)
4700-4750 AERONAUTICAL MOBILE (OR)			4700-4750 AERONAUTICAL MOBILE (OR) US340		
4750-4850 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE BROADCASTING 5.113	4750-4850 FIXED MOBILE except aeronautical mobile (R) BROADCASTING 5.113	4750-4850 FIXED BROADCASTING 5.113 Land mobile	4750-4850 FIXED MOBILE except aeronautical mobile (R) US340		Maritime (80) Private Land Mobile (90)
4850-4995 FIXED LAND MOBILE BROADCASTING 5.113			4850-4995 FIXED MOBILE US340	4850-4995 FIXED US340	Aviation (87) Private Land Mobile (90)
4995-5003 STANDARD FREQUENCY AND TIME SIGNAL (5000 kHz)			4995-5003 STANDARD FREQUENCY AND TIME SIGNAL (5000 kHz) US340		

5003-5005 STANDARD FREQUENCY AND TIME SIGNAL Space research			5003-5005 STANDARD FREQUENCY AND TIME SIGNAL US340 G106	5003-5005 STANDARD FREQUENCY AND TIME SIGNAL US340	
5005-5060 FIXED BROADCASTING 5.113			5005-5060 FIXED US340		Maritime (80) Aviation (87) Private Land Mobile (90)
5060-5250 FIXED Mobile except aeronautical mobile 5.133			5060-5450 FIXED Mobile except aeronautical mobile		Maritime (80) Aviation (87) Private Land Mobile (90) Amateur (97)
5250-5450 FIXED MOBILE except aeronautical mobile			US212 US340 US381		
5450-5480 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	5450-5480 AERONAUTICAL MOBILE (R)	5450-5480 FIXED AERONAUTICAL MOBILE (OR) LAND MOBILE	5450-5680 AERONAUTICAL MOBILE (R)		Aviation (87)
5480-5680 AERONAUTICAL MOBILE (R) 5.111 5.115			5.111 5.115 US283 US340		
5680-5730 AERONAUTICAL MOBILE (OR) 5.111 5.115			5680-5730 AERONAUTICAL MOBILE (OR) 5.111 5.115 US340		
5730-5900 FIXED LAND MOBILE	5730-5900 FIXED MOBILE except aeronautical mobile (R)	5730-5900 FIXED Mobile except aeronautical mobile (R)	5730-5900 FIXED MOBILE except aeronautical mobile (R) US340		Maritime (80) Aviation (87) Private Land Mobile (90)
5900-5950 BROADCASTING 5.134 5.136			5900-5950 BROADCASTING 5.134 FIXED MOBILE except aeronautical mobile US340 US366		Radio Broadcast (HF) (73) Maritime (80)
5950-6200 BROADCASTING			5950-6200 BROADCASTING US340		Radio Broadcast (HF) (73)
6200-6525 MARITIME MOBILE 5.109 5.110 5.130 5.132 5.137			6200-6525 MARITIME MOBILE 5.109 5.110 5.130 5.132 US82 US296 US340		Maritime (80)
6525-6685 AERONAUTICAL MOBILE (R)			6525-6685 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)
6685-6765 AERONAUTICAL MOBILE (OR)			6685-6765 AERONAUTICAL MOBILE (OR) US340		

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
6765-7000 FIXED MOBILE except aeronautical mobile (R) 5.138 5.138A 5.139			6765-7000 FIXED MOBILE except aeronautical mobile (R) 5.138 US340 US394		ISM Equipment (18) Private Land Mobile (90)
7000-7100 AMATEUR AMATEUR-SATELLITE 5.140 5.141 5.141A			7000-7100 US340	7000-7100 AMATEUR AMATEUR-SATELLITE US340	Amateur (97)
7100-7200 AMATEUR 5.141A 5.141B 5.141C 5.142			7100-7300	7100-7300 AMATEUR	
7200-7300 BROADCASTING	7200-7300 AMATEUR 5.142	7200-7300 BROADCASTING	US340 US395	5.142 US340 US395	
7300-7400 BROADCASTING 5.134 5.143 5.143A 5.143B 5.143C 5.143D			7300-7400 BROADCASTING 5.134 US340 US396		Radio Broadcast (HF) (73) Maritime (80) Private Land Mobile (90)
7400-7450 BROADCASTING 5.143B 5.143C	7400-7450 FIXED MOBILE except aeronautical mobile (R)	7400-7450 BROADCASTING 5.143A 5.143C	7400-8100 FIXED MOBILE except aeronautical mobile (R)		Radio Broadcast (HF) (73) Maritime (80) Aviation (87) Private Land Mobile (90)
7450-8100 FIXED MOBILE except aeronautical mobile (R) 5.143E 5.144			US340		
8100-8195 FIXED MARITIME MOBILE			8100-8195 FIXED MARITIME MOBILE US340		Maritime (80)
8195-8815 MARITIME MOBILE 5.109 5.110 5.132 5.145 5.111			8195-8815 MARITIME MOBILE 5.109 5.110 5.132 5.145 US82 5.111 US296 US340		Maritime (80) Aviation (87)
8815-8965 AERONAUTICAL MOBILE (R)			8815-8965 AERONAUTICAL MOBILE (R) US340		Aviation (87)
8965-9040 AERONAUTICAL MOBILE (OR)			8965-9040 AERONAUTICAL MOBILE (OR) US340		
9040-9400 FIXED			9040-9400 FIXED US340		Maritime (80) Private Land Mobile (90)

9400-9500 BROADCASTING 5.134 5.146	9400-9500 BROADCASTING 5.134 FIXED US340 US366		Radio Broadcast (HF) (73) Maritime (80)
9500-9900 BROADCASTING 5.147	9500-9900 BROADCASTING 5.147 US340 US367		Radio Broadcast (HF) (73)
9900-9995 FIXED	9900-9995 FIXED US340		Private Land Mobile (90)
9995-10003 STANDARD FREQUENCY AND TIME SIGNAL (10000 kHz) 5.111	9995-10003 STANDARD FREQUENCY AND TIME SIGNAL (10000 kHz) 5.111 US340		
10003-10005 STANDARD FREQUENCY AND TIME SIGNAL Space research 5.111	10003-10005 STANDARD FREQUENCY AND TIME SIGNAL 5.111 US340 G106	10003-10005 STANDARD FREQUENCY AND TIME SIGNAL 5.111 US340	
10005-10100 AERONAUTICAL MOBILE (R) 5.111	10005-10100 AERONAUTICAL MOBILE (R) 5.111 US283 US340		Aviation (87)
10100-10150 FIXED Amateur	10100-10150 US247 US340	10100-10150 AMATEUR US247 US340	Amateur (97)
10150-11175 FIXED Mobile except aeronautical mobile (R)	10150-11175 FIXED Mobile except aeronautical mobile (R) US340		Private Land Mobile (90)
11175-11275 AERONAUTICAL MOBILE (OR)	11175-11275 AERONAUTICAL MOBILE (OR) US340		
11275-11400 AERONAUTICAL MOBILE (R)	11275-11400 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)
11400-11600 FIXED	11400-11600 FIXED US340		Private Land Mobile (90)
11600-11650 BROADCASTING 5.134 5.146	11600-11650 BROADCASTING 5.134 FIXED US340 US366		Radio Broadcast (HF) (73)
11650-12050 BROADCASTING 5.147	11650-12050 BROADCASTING US340 US367		

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
12050-12100 BROADCASTING 5.134 5.146			12050-12100 BROADCASTING 5.134 FIXED US340 US366		Radio Broadcast (HF) (73)
12100-12230 FIXED			12100-12230 FIXED US340		Private Land Mobile (90)
12230-13200 MARITIME MOBILE 5.109 5.110 5.132 5.145			12230-13200 MARITIME MOBILE 5.109 5.110 5.132 5.145 US82 US296 US340		Maritime (80)
13200-13260 AERONAUTICAL MOBILE (OR)			13200-13260 AERONAUTICAL MOBILE (OR) US340		
13260-13360 AERONAUTICAL MOBILE (R)			13260-13360 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)
13360-13410 FIXED RADIO ASTRONOMY 5.149			13360-13410 RADIO ASTRONOMY US342 G115	13360-13410 RADIO ASTRONOMY US342	
13410-13570 FIXED Mobile except aeronautical mobile (R) 5.150			13410-13570 FIXED Mobile except aeronautical mobile (R) 5.150 US340	13410-13570 FIXED 5.150 US340	ISM Equipment (18) Private Land Mobile (90)
13570-13600 BROADCASTING 5.134 5.151			13570-13600 BROADCASTING 5.134 FIXED Mobile except aeronautical mobile US340 US366	13570-13600 BROADCASTING 5.134 US340 US366	Radio Broadcast (HF) (73)
13600-13800 BROADCASTING			13600-13800 BROADCASTING US340		
13800-13870 BROADCASTING 5.134 5.151			13800-13870 BROADCASTING 5.134 FIXED Mobile except aeronautical mobile US340 US366	13800-13870 BROADCASTING 5.134 FIXED US340 US366	
13870-14000 FIXED Mobile except aeronautical mobile (R)			13870-14000 FIXED Mobile except aeronautical mobile (R) US340	13870-14000 FIXED US340	Private Land Mobile (90)

14000-14250 AMATEUR AMATEUR-SATELLITE	14000-14350	14000-14250 AMATEUR AMATEUR-SATELLITE US340	Amateur (97)
14250-14350 AMATEUR 5.152	US340	14250-14350 AMATEUR US340	
14350-14990 FIXED Mobile except aeronautical mobile (R)	14350-14990 FIXED Mobile except aeronautical mobile (R) US340	14350-14990 FIXED US340	Private Land Mobile (90)
14990-15005 STANDARD FREQUENCY AND TIME SIGNAL (15000 kHz) 5.111	14990-15005 STANDARD FREQUENCY AND TIME SIGNAL (15000 kHz) 5.111 US340		
15005-15010 STANDARD FREQUENCY AND TIME SIGNAL Space research	15005-15010 STANDARD FREQUENCY AND TIME SIGNAL US340 G106	15005-15010 STANDARD FREQUENCY AND TIME SIGNAL US340	
15010-15100 AERONAUTICAL MOBILE (OR)	15010-15100 AERONAUTICAL MOBILE (OR) US340		
15100-15600 BROADCASTING	15100-15600 BROADCASTING US340		Radio Broadcast (HF) (73)
15600-15800 BROADCASTING 5.134 5.146	15600-15800 BROADCASTING 5.134 FIXED US340 US366		
15800-16360 FIXED 5.153	15800-16360 FIXED US340		Private Land Mobile (90)
16360-17410 MARITIME MOBILE 5.109 5.110 5.132 5.145	16360-17410 MARITIME MOBILE 5.109 5.110 5.132 5.145 US82 US296 US340		Maritime (80)
17410-17480 FIXED	17410-17480 FIXED US340		Private Land Mobile (90)
17480-17550 BROADCASTING 5.134 5.146	17480-17550 BROADCASTING 5.134 FIXED US340 US366	17480-17550 BROADCASTING 5.134 US340 US366	Radio Broadcast (HF) (73)
17550-17900 BROADCASTING	17550-17900 BROADCASTING US340		

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
17900-17970 AERONAUTICAL MOBILE (R)			17900-17970 AERONAUTICAL MOBILE (R) US283 US340		Aviation (87)
17970-18030 AERONAUTICAL MOBILE (OR)			17970-18030 AERONAUTICAL MOBILE (OR) US340		
18030-18052 FIXED			18030-18068 FIXED		Maritime (80) Private Land Mobile (90)
18052-18068 FIXED Space research			US340		
18068-18168 AMATEUR AMATEUR-SATELLITE 5.154			18068-18168 US340	18068-18168 AMATEUR AMATEUR-SATELLITE US340	Amateur (97)
18168-18780 FIXED Mobile except aeronautical mobile			18168-18780 FIXED Mobile US340		Maritime (80) Private Land Mobile (90)
18780-18900 MARITIME MOBILE			18780-18900 MARITIME MOBILE US82 US296 US340		Maritime (80)
18900-19020 BROADCASTING 5.134 5.146			18900-19020 BROADCASTING 5.134 FIXED US340 US366	18900-19020 BROADCASTING 5.134 US340 US366	Radio Broadcast (HF) (73)
19020-19680 FIXED			19020-19680 FIXED US340		Private Land Mobile (90)
19680-19800 MARITIME MOBILE 5.132			19680-19800 MARITIME MOBILE 5.132 US340		Maritime (80)
19800-19990 FIXED			19800-19990 FIXED US340		Private Land Mobile (90)
19990-19995 STANDARD FREQUENCY AND TIME SIGNAL Space research 5.111			19990-20010 STANDARD FREQUENCY AND TIME SIGNAL (20000 kHz)	19990-20010 STANDARD FREQUENCY AND TIME SIGNAL (20000 kHz)	
19995-20010 STANDARD FREQUENCY AND TIME SIGNAL (20000 kHz) 5.111			5.111 US340 G106	5.111 US340	

20010-21000 FIXED Mobile	20010-21000 FIXED Mobile US340	20010-21000 FIXED US340	Private Land Mobile (90)
21000-21450 AMATEUR AMATEUR-SATELLITE	21000-21450 US340	21000-21450 AMATEUR AMATEUR-SATELLITE US340	Amateur (97)
21450-21850 BROADCASTING	21450-21850 BROADCASTING US340		Radio Broadcast (HF) (73)
21850-21870 FIXED 5.155A 5.155	21850-21924 FIXED US340		Aviation (87) Private Land Mobile (90)
21870-21924 FIXED 5.155B			
21924-22000 AERONAUTICAL MOBILE (R)	21924-22000 AERONAUTICAL MOBILE (R) US340		Aviation (87)
22000-22855 MARITIME MOBILE 5.132 5.156	22000-22855 MARITIME MOBILE 5.132 US82 US296 US340		Maritime (80)
22855-23000 FIXED 5.156	22855-23000 FIXED US340		Private Land Mobile (90)
23000-23200 FIXED Mobile except aeronautical mobile (R) 5.156	23000-23200 FIXED Mobile except aeronautical mobile (R) US340	23000-23200 FIXED US340	
23200-23350 FIXED 5.156A AERONAUTICAL MOBILE (OR)	23200-23350 AERONAUTICAL MOBILE (OR) US340		
23350-24000 FIXED MOBILE except aeronautical mobile 5.157	23350-24890 FIXED MOBILE except aeronautical mobile US340	23350-24890 FIXED US340	Private Land Mobile (90)
24000-24890 FIXED LAND MOBILE			
24890-24990 AMATEUR AMATEUR-SATELLITE	24890-24990 US340	24890-24990 AMATEUR AMATEUR-SATELLITE US340	Amateur (97)
24990-25005 STANDARD FREQUENCY AND TIME SIGNAL (25000 kHz)	24990-25005 STANDARD FREQUENCY AND TIME SIGNAL (25000 kHz) US340		

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
25005-25010 STANDARD FREQUENCY AND TIME SIGNAL Space research			25005-25010 STANDARD FREQUENCY AND TIME SIGNAL US340 G106	25005-25010 STANDARD FREQUENCY AND TIME SIGNAL US340	
25010-25070 FIXED MOBILE except aeronautical mobile			25010-25070 US340	25010-25070 LAND MOBILE US340 NG112	Private Land Mobile (90)
25070-25210 MARITIME MOBILE			25070-25210 MARITIME MOBILE US82 US281 US296 US340	25070-25210 MARITIME MOBILE US82 US281 US296 US340 NG112	Maritime (80) Private Land Mobile (90)
25210-25550 FIXED MOBILE except aeronautical mobile			25210-25330 US340	25210-25330 LAND MOBILE US340	Private Land Mobile (90)
			25330-25550 FIXED MOBILE except aeronautical mobile US340	25330-25550 US340	
25550-25670 RADIO ASTRONOMY 5.149			25550-25670 RADIO ASTRONOMY US74 US342		
25670-26100 BROADCASTING			25670-26100 BROADCASTING US25 US340		Radio Broadcast (HF) (73) Remote Pickup (74D)
26100-26175 MARITIME MOBILE 5.132			26100-26175 MARITIME MOBILE 5.132 US25 US340		Remote Pickup (74D) Maritime (80)
26175-27500 FIXED MOBILE except aeronautical mobile			26175-26480 US340	26175-26480 LAND MOBILE US340	Remote Pickup (74D)
			26480-26950 FIXED MOBILE except aeronautical mobile US10 US340	26480-26950 US10 US340	
			26950-27410	26950-26960 FIXED 5.150 US340	ISM Equipment (18)
				26960-27230 MOBILE except aeronautical mobile 5.150 US340	ISM Equipment (18) Personal Radio (95)
				27230-27410 FIXED MOBILE except aeronautical mobile 5.150 US340	ISM Equipment (18) Private Land Mobile (90) Personal Radio (95)

5.150 27500-28000 METEOROLOGICAL AIDS FIXED MOBILE	27410-27540 US340	27410-27540 FIXED LAND MOBILE US340	Private Land Mobile (90)
	27540-28000 FIXED MOBILE US298 US340	27540-28000 US298 US340	

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
28-29.7 AMATEUR AMATEUR-SATELLITE			28-29.89	28-29.7 AMATEUR AMATEUR-SATELLITE US340	Amateur (97)
29.7-30.005 FIXED MOBILE				29.7-29.8 LAND MOBILE US340	Private Land Mobile (90)
				29.8-29.89 FIXED US340	
			29.89-29.91 FIXED MOBILE US340	29.89-29.91 US340	
			29.91-30 US340	29.91-30 FIXED US340	
30.005-30.01 SPACE OPERATION (satellite identification) FIXED MOBILE SPACE RESEARCH			30-30.56 FIXED MOBILE	30-30.56	
30.01-37.5 FIXED MOBILE			30.56-32	30.56-32 FIXED LAND MOBILE NG124	Private Land Mobile (90)
			32-33 FIXED MOBILE	32-33	
			33-34	33-34 FIXED LAND MOBILE NG124	Private Land Mobile (90)
			34-35 FIXED MOBILE	34-35	
			35-36	35-36 FIXED LAND MOBILE	Public Mobile (22) Private Land Mobile (90)
			36-37 FIXED MOBILE US220	36-37 US220	

			37-37.5	37-37.5 LAND MOBILE NG124	Private Land Mobile (90)
37.5-38.25 FIXED MOBILE Radio astronomy 5.149			37.5-38 Radio astronomy US342	37.5-38 LAND MOBILE Radio astronomy US342 NG59 NG124	
			38-38.25 FIXED MOBILE RADIO ASTRONOMY US81 US342	38-38.25 RADIO ASTRONOMY US81 US342	
38.25-39.986 FIXED MOBILE			38.25-39 FIXED MOBILE	38.25-39	
			39-40	39-40 LAND MOBILE NG124	Private Land Mobile (90)
39.986-40.02 FIXED MOBILE Space research			40-42 FIXED MOBILE	40-40.98 5.150 US210	ISM Equipment (18) Private Land Mobile (90)
40.02-40.98 FIXED MOBILE 5.150					
40.98-41.015 FIXED MOBILE Space research 5.160 5.161				40.98-42 US220	
41.015-44 FIXED MOBILE 5.160 5.161			42-46.6	42-43.69 FIXED LAND MOBILE NG124 NG141	Public Mobile (22) Private Land Mobile (90)
				43.69-46.6 LAND MOBILE NG124 NG141	Private Land Mobile (90)
44-47 FIXED MOBILE 5.162 5.162A			46.6-47 FIXED MOBILE	46.6-47	
47-68 BROADCASTING 5.162A 5.163 5.164 5.165 5.169 5.171	47-50 FIXED MOBILE	47-50 FIXED MOBILE BROADCASTING 5.162A	47-49.6	47-49.6 LAND MOBILE NG124	Private Land Mobile (90)
			49.6-50 FIXED MOBILE	49.6-50	

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
See previous page for 47-68 MHz	50-54 AMATEUR 5.162A 5.166 5.167 5.168 5.170		50-73	50-54 AMATEUR	Amateur (97)
	54-68 BROADCASTING Fixed Mobile 5.172	54-68 FIXED MOBILE BROADCASTING 5.162A		54-72 BROADCASTING NG115 NG128 NG149	Broadcast Radio (TV) (73) Auxiliary Broadcasting (74)
68-74.8 FIXED MOBILE except aeronautical mobile	68-72 BROADCASTING Fixed Mobile 5.173	68-74.8 FIXED MOBILE			
	72-73 FIXED MOBILE			72-73 FIXED MOBILE NG3 NG49 NG56	Public Mobile (22) Aviation (87) Private Land Mobile (90) Personal Radio (95)
	73-74.6 RADIO ASTRONOMY 5.178		73-74.6 RADIO ASTRONOMY US74 US246		
	74.6-74.8 FIXED MOBILE		74.6-74.8 FIXED MOBILE		Aviation (87) Private Land Mobile (90)
5.149 5.174 5.175 5.177 5.179		5.149 5.176 5.179	US273		
74.8-75.2 AERONAUTICAL RADIONAVIGATION 5.180 5.181			74.8-75.2 AERONAUTICAL RADIONAVIGATION 5.180		Aviation (87)
75.2-87.5 FIXED MOBILE except aeronautical mobile	75.2-75.4 FIXED MOBILE 5.179		75.2-75.4 FIXED MOBILE US273		Private Land Mobile (90)
	75.4-76 FIXED MOBILE	75.4-87 FIXED MOBILE	75.4-88	75.4-76 FIXED MOBILE NG3 NG49 NG56	Public Mobile (22) Private Land Mobile (90) Personal Radio (95)
	76-88 BROADCASTING Fixed Mobile 5.185	5.182 5.183 5.188 87-100 FIXED MOBILE BROADCASTING		76-88 BROADCASTING NG128 NG149	Broadcast Radio (TV) (73) Auxiliary Broadcasting (74)
5.175 5.179 5.184 5.187 87.5-100 BROADCASTING					
	88-100 BROADCASTING		88-108	88-108 BROADCASTING NG2	Broadcast Radio (FM) (73) Auxiliary Broadcasting (74)
5.190					

100-108 BROADCASTING 5.192 5.194		 US93	 US93 NG128	
108-117.975 AERONAUTICAL RADIONAVIGATION 5.197 5.197A	108-117.975 AERONAUTICAL RADIONAVIGATION US93 US343			Aviation (87)
117.975-137 AERONAUTICAL MOBILE (R)	117.975-121.9375 AERONAUTICAL MOBILE (R) 5.111 5.198 5.199 5.200 US26 US28			
	121.9375-123.0875 5.198 US30 US31 US33 US80 US102 US213		121.9375-123.0875 AERONAUTICAL MOBILE 5.198 US30 US31 US33 US80 US102 US213	
	123.0875-123.5875 AERONAUTICAL MOBILE 5.198 5.200 US32 US33 US112			
	123.5875-128.8125 AERONAUTICAL MOBILE (R) 5.198 US26			
	128.8125-132.0125 5.198		128.8125-132.0125 AERONAUTICAL MOBILE (R) 5.198	
	132.0125-136 AERONAUTICAL MOBILE (R) 5.198 US26			
	136-137 US244		136-137 AERONAUTICAL MOBILE (R) US244	
5.111 5.198 5.199 5.200 5.201 5.202 5.203 5.203A 5.203B				
137-137.025 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208	137-137.025 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) US319 US320 SPACE RESEARCH (space-to-Earth) 5.208			Satellite Communications (25)
137.025-137.175 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile-satellite (space-to-Earth) 5.208A 5.209 Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208	137.025-137.175 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Mobile-satellite (space-to-Earth) US319 US320 5.208			

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
137.175-137.825 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208			137.175-137.825 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) US319 US320 SPACE RESEARCH (space-to-Earth) 5.208		Satellite Communications (25)
137.825-138 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile-satellite (space-to-Earth) 5.208A 5.209 Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208			137.825-138 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Mobile-satellite (space-to-Earth) US319 US320 5.208		
138-143.6 AERONAUTICAL MOBILE (OR) 5.210 5.211 5.212 5.214	138-143.6 FIXED MOBILE RADIOLOCATION Space research (space-to-Earth)	138-143.6 FIXED MOBILE Space research (space-to-Earth) 5.207 5.213	138-144 FIXED MOBILE	138-144	
143.6-143.65 AERONAUTICAL MOBILE (OR) SPACE RESEARCH (space-to-Earth) 5.211 5.212 5.214	143.6-143.65 FIXED MOBILE RADIOLOCATION SPACE RESEARCH (space-to-Earth)	143.6-143.65 FIXED MOBILE SPACE RESEARCH (space-to-Earth) 5.207 5.213			
143.65-144 AERONAUTICAL MOBILE (OR) 5.210 5.211 5.212 5.214	143.65-144 FIXED MOBILE RADIOLOCATION Space research (space-to-Earth)	143.65-144 FIXED MOBILE Space research (space-to-Earth) 5.207 5.213	G30		
144-146 AMATEUR AMATEUR-SATELLITE 5.216			144-148	144-146 AMATEUR AMATEUR-SATELLITE	Amateur (97)
146-148 FIXED MOBILE except aeronautical mobile (R)	146-148 AMATEUR 5.217	146-148 AMATEUR FIXED MOBILE 5.217		146-148 AMATEUR	
148-149.9 FIXED MOBILE except aeronautical mobile (R) MOBILE-SATELLITE (Earth-to-space) 5.209	148-149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.209		148-149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) US319 US320 US323 US325	148-149.9 MOBILE-SATELLITE (Earth-to-space) US319 US320 US323 US325	Satellite Communications (25)

5.218 5.219 5.221	5.218 5.219 5.221	5.218 5.219 G30	5.218 5.219	
149.9-150.05 MOBILE-SATELLITE (Earth-to-space) 5.209 5.224A RADIONAVIGATION-SATELLITE 5.224B 5.220 5.222 5.223		149.9-150.05 MOBILE-SATELLITE (Earth-to-space) US319 US320 RADIONAVIGATION-SATELLITE 5.223		
150.05-153 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149	150.05-156.7625 FIXED MOBILE	150.05-150.8 FIXED MOBILE US216 G30	150.05-150.8 US216	
		150.8-152.855 US216	150.8-152.855 FIXED LAND MOBILE NG4 NG51 NG112 US216 NG124	Public Mobile (22) Private Land Mobile (90) Personal Radio (95)
153-154 FIXED MOBILE except aeronautical mobile (R) Meteorological aids		152.855-156.2475	152.855-154 LAND MOBILE NG4 NG124	Auxiliary Broadcasting (74) Private Land Mobile (90)
154-156.7625 FIXED MOBILE except aeronautical mobile (R) 5.226 5.227	5.225 5.226 5.227		154-156.2475 FIXED LAND MOBILE NG112 5.226 NG117 NG124 NG148	Maritime (80) Private Land Mobile (90) Personal Radio (95)
156.7625-156.8375 MARITIME MOBILE (distress and calling) 5.111 5.226		156.2475-157.0375 5.226 5.227 US77 US106 US107 US266	156.2475-157.0375 MARITIME MOBILE US77 US106 US107 NG117 5.226 5.227 US266	Maritime (80) Aviation (87)
156.8375-174 FIXED MOBILE except aeronautical mobile	156.8375-174 FIXED MOBILE	157.0375-157.1875 MARITIME MOBILE US214 5.226 US266 G109	157.0375-157.1875 5.226 US214 US266	Maritime (80) Private Land Mobile (90)
		157.1875-161.5875	157.1875-157.45 LAND MOBILE US266 MARITIME MOBILE 5.226 NG111	
			157.45-161.575 FIXED LAND MOBILE NG28 NG111 5.226 NG6 NG70 NG112 NG124 NG148 NG155	Public Mobile (22) Auxiliary Broadcasting (74) Maritime (80) Private Land Mobile (90)
		161.5875-161.6125 5.226 US77	161.575-161.625 MARITIME MOBILE US77 5.226 NG6 NG17	Public Mobile (22) Maritime (80)
		161.6125-161.775	161.625-161.775 LAND MOBILE NG6 5.226	Public Mobile (22) Auxiliary Broadcasting (74)
5.226 5.229	5.226 5.230 5.231 5.232			

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
See previous page for 156.8375-174 MHz			161.775-162.0125 5.226 US266	161.775-162.0125 LAND MOBILE US266 NG6 MARITIME MOBILE 5.226	Public Mobile (22) Maritime (80) Private Land Mobile (90)
			162.0125-173.2 FIXED US13 MOBILE 5.226 US8 US11 US216 US300 US312 G5	162.0125-173.2 5.226 US8 US11 US13 US216 US300 US312	Auxiliary Broadcasting (74) Maritime (80) Private Land Mobile (90)
			173.2-173.4	173.2-173.4 FIXED Land mobile	Private Land Mobile (90)
			173.4-174 FIXED MOBILE G5	173.4-174	
174-223 BROADCASTING	174-216 BROADCASTING Fixed Mobile 5.234	174-223 FIXED MOBILE BROADCASTING	174-216	174-216 BROADCASTING NG115 NG128 NG149	Broadcast Radio (TV) (73) Auxiliary Broadcasting (74)
	216-220 FIXED MARITIME MOBILE Radiolocation 5.241 5.242		216-217 Fixed Land mobile Radiolocation 5.241 G2 US210 US229	216-219 FIXED MOBILE except aeronautical mobile US210 US229 NG173	Maritime (80) Private Land Mobile (90) Personal Radio (95)
			217-220 Fixed Mobile US210 US229	219-220 FIXED MOBILE except aeronautical mobile Amateur NG152 US210 US229 NG173	Maritime (80) Private Land Mobile (90) Amateur (97)
	220-225 AMATEUR FIXED MOBILE Radiolocation 5.241		220-222 FIXED LAND MOBILE Radiolocation 5.241 G2 US335	220-222 FIXED LAND MOBILE US335	Private Land Mobile (90)
5.235 5.237 5.243		5.233 5.238 5.240 5.245	222-225 Radiolocation 5.241 G2	222-225 AMATEUR	Amateur (97)
223-230 BROADCASTING Fixed Mobile		223-230 FIXED MOBILE BROADCASTING			

	225-235 FIXED MOBILE	AERONAUTICAL RADIONAVIGATION Radiolocation	225-235 FIXED MOBILE	225-235	
5.243 5.246 5.247		5.250			
230-235 FIXED MOBILE		230-235 FIXED MOBILE AERONAUTICAL RADIONAVIGATION			
5.247 5.251 5.252		5.250	G27		
235-267 FIXED MOBILE			235-267 FIXED MOBILE	235-267	
5.111 5.199 5.252 5.254 5.256 5.256A			5.111 5.199 5.256 G27 G100	5.111 5.199 5.256	
267-272 FIXED MOBILE Space operation (space-to-Earth)			267-322 FIXED MOBILE	267-322	
5.254 5.257					
272-273 SPACE OPERATION (space-to-Earth) FIXED MOBILE					
5.254					
273-312 FIXED MOBILE					
5.254					
312-315 FIXED MOBILE Mobile-satellite (Earth-to-space) 5.254 5.255					
315-322 FIXED MOBILE					
5.254			G27 G100		
322-328.6 FIXED MOBILE RADIO ASTRONOMY			322-328.6 FIXED MOBILE	322-328.6	
5.149			US342 G27	US342	
328.6-335.4 AERONAUTICAL RADIONAVIGATION 5.258			328.6-335.4 AERONAUTICAL RADIONAVIGATION 5.258		
5.259					

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
335.4-387 FIXED MOBILE 5.254			335.4-399.9 FIXED MOBILE	335.4-399.9	
387-390 FIXED MOBILE Mobile-satellite (space-to-Earth) 5.208A 5.254 5.255					
390-399.9 FIXED MOBILE 5.254			 G27 G100		
399.9-400.05 MOBILE-SATELLITE (Earth-to-space) 5.209 5.224A RADIONAVIGATION-SATELLITE 5.222 5.224B 5.260 5.220			399.9-400.05 MOBILE-SATELLITE (Earth-to-space) US319 US320 RADIONAVIGATION-SATELLITE 5.260		Satellite Communications (25)
400.05-400.15 STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 5.261 5.262			400.05-400.15 STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 5.261		
400.15-401 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.209 SPACE RESEARCH (space-to-Earth) 5.263 Space operation (space-to-Earth) 5.262 5.264			400.15-401 METEOROLOGICAL AIDS (radiosonde) US70 METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to- Earth) US319 US320 US324 SPACE RESEARCH (space-to-Earth) 5.263 Space operation (space-to-Earth) 5.264	400.15-401 METEOROLOGICAL AIDS (radiosonde) US70 MOBILE-SATELLITE (space-to- Earth) US319 US320 US324 SPACE RESEARCH (space-to-Earth) 5.263 Space operation (space-to-Earth) 5.264	Satellite Communications (25)
401-402 METEOROLOGICAL AIDS SPACE OPERATION (space-to-Earth) EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile			401-402 METEOROLOGICAL AIDS (radiosonde) US70 SPACE OPERATION (space-to-Earth) EARTH EXPLORATION- SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) US384	401-402 METEOROLOGICAL AIDS (radiosonde) US70 SPACE OPERATION (space-to-Earth) Earth exploration-satellite (Earth-to-space) Meteorological-satellite (Earth-to-space) US384	
402-403 METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed			402-403 METEOROLOGICAL AIDS (radiosonde) US70 EARTH EXPLORATION- SATELLITE (Earth-to-space)	402-403 METEOROLOGICAL AIDS (radiosonde) US70 Earth exploration-satellite (Earth-to-space)	Personal Radio (95)

Mobile except aeronautical mobile		METEOROLOGICAL-SATELLITE (Earth-to-space) US345 US384	Meteorological-satellite (Earth-to-space) US345 US384	
403-406 METEOROLOGICAL AIDS Fixed Mobile except aeronautical mobile		403-406 METEOROLOGICAL AIDS (radiosonde) US70 US345 G6	403-406 METEOROLOGICAL AIDS (radiosonde) US70 US345	
406-406.1 MOBILE-SATELLITE (Earth-to-space) 5.266 5.267		406-406.1 MOBILE-SATELLITE (Earth-to-space) 5.266 5.267		
406.1-410 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149		406.1-410 FIXED US13 MOBILE RADIO ASTRONOMY US74 US117 G5 G6	406.1-410 RADIO ASTRONOMY US74 US13 US117	Private Land Mobile (90)
410-420 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) 5.268		410-420 FIXED US13 MOBILE SPACE RESEARCH (space-to-space) 5.268 G5	410-420 US13	
420-430 FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271		420-450 RADIOLOCATION US217 G2 G129	420-450 Amateur US7 NG135	Private Land Mobile (90) Amateur (97)
430-432 AMATEUR RADIOLOCATION 5.271 5.272 5.273 5.274 5.275 5.276 5.277	430-432 RADIOLOCATION Amateur 5.271 5.276 5.277 5.278 5.279			
432-438 AMATEUR RADIOLOCATION Earth exploration-satellite (active) 5.279A 5.138 5.271 5.272 5.276 5.277 5.280 5.281 5.282	432-438 RADIOLOCATION Amateur Earth exploration-satellite (active) 5.279A 5.271 5.276 5.277 5.278 5.279 5.281 5.282			
438-440 AMATEUR RADIOLOCATION 5.271 5.273 5.274 5.275 5.276 5.277 5.283	438-440 RADIOLOCATION Amateur 5.271 5.276 5.277 5.278 5.279			
440-450 FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271 5.284 5.285 5.286		5.286 US7 US87 US230 US397 G8	5.282 5.286 US87 US217 US230 US397	

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			454-456	454-455 FIXED LAND MOBILE NG12 NG112 NG148	Public Mobile (22) Maritime (80)
455-456 FIXED MOBILE 5.209 5.271 5.286A 5.286B 5.286C 5.286E	455-456 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C 5.209	455-456 FIXED MOBILE 5.209 5.271 5.286A 5.286B 5.286C 5.286E		455-456 LAND MOBILE	Auxiliary Broadcasting (74)
456-459 FIXED MOBILE 5.271 5.287 5.288			456-460	456-460 FIXED LAND MOBILE	Public Mobile (22) Maritime (80) Private Land Mobile (90)
459-460 FIXED MOBILE 5.209 5.271 5.286A 5.286B 5.286C 5.286E	459-460 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C 5.209	459-460 FIXED MOBILE 5.209 5.271 5.286A 5.286B 5.286C 5.286E	 5.287 5.288	 5.287 5.288 NG112 NG124 NG148	
460-470 FIXED MOBILE Meteorological-satellite (space-to-Earth)			460-470 Meteorological-satellite (space-to-Earth)	460-462.5375 FIXED LAND MOBILE 5.289 US201 US209 NG124	Private Land Mobile (90)
				462.5375-462.7375 LAND MOBILE 5.289 US201	Personal Radio (95)
				462.7375-467.5375 FIXED LAND MOBILE 5.287 5.289 U S201 US209 US216 NG124	Private Land Mobile (90)
				467.5375-467.7375 LAND MOBILE 5.287 5.289 US201	Personal Radio (95)
				467.7375-470 FIXED LAND MOBILE	Private Land Mobile (90)
5.287 5.288 5.289 5.290			5.287 5.288 5.289 US201 US209 US216	5.288 5.289 US201 US216 NG124	

470-790 BROADCASTING	470-512 BROADCASTING Fixed Mobile 5.292 5.293	470-585 FIXED MOBILE BROADCASTING 5.291 5.298	470-608	470-512 FIXED LAND MOBILE BROADCASTING NG66 NG115 NG128 NG149	Public Mobile (22) Broadcast Radio (TV) (73) Auxiliary Broadcasting (74) Private Land Mobile (90)
	512-608 BROADCASTING 5.297	585-610 FIXED MOBILE BROADCASTING RADIONAVIGATION 5.149 5.305 5.306 5.307		512-608 BROADCASTING NG115 NG128 NG149	Broadcast Radio (TV) (73) Auxiliary Broadcasting (74)
	608-614 RADIO ASTRONOMY Mobile-satellite except aeronautical mobile-satellite (Earth-to-space)		608-614 RADIO ASTRONOMY US74 LAND MOBILE (medical telemetry and medical telecommand) US246		Personal (95)
	614-806 BROADCASTING Fixed Mobile	610-890 FIXED MOBILE 5.317A BROADCASTING	614-890	614-698 BROADCASTING NG115 NG128 NG149	Broadcast Radio (TV) (73) Auxiliary Broadcasting (74)
				698-764 FIXED MOBILE BROADCASTING NG159 NG115 NG128	Wireless Communication (27) Broadcast Radio (TV) (73) Auxiliary Broadcasting (74) Private Land Mobile (90)
				764-776 FIXED MOBILE NG115 NG128 NG158 NG159	Auxiliary Broadcasting (74) Private Land Mobile (90)
5.149 5.291A 5.294 5.296 5.300 5.302 5.304 5.306 5.311 5.312				776-794 FIXED MOBILE BROADCASTING NG115 NG128 NG159	Wireless Communications (27) Broadcast Radio (TV) (73) Auxiliary Broadcasting (74) Private Land Mobile (90)
790-862 FIXED BROADCASTING				794-806 FIXED MOBILE NG115 NG128 NG158 NG159	Auxiliary Broadcasting (74) Private Land Mobile (90)
	5.293 5.309 5.311				
	806-890 FIXED MOBILE BROADCASTING			806-809 LAND MOBILE	Private Land Mobile (90)
				809-821 FIXED LAND MOBILE NG31	Public Mobile (22) Private Land Mobile (90)
				821-824 LAND MOBILE	Private Land Mobile (90)
5.312 5.314 5.315 5.316 5.319 5.321				824-849 FIXED LAND MOBILE	Public Mobile (22)
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862-890 FIXED MOBILE except aeronautical mobile BROADCASTING 5.322 5.319 5.323				854-869 FIXED LAND MOBILE NG31	Public Mobile (22) Private Land Mobile (90)
				869-894 FIXED LAND MOBILE US116 US268	Public Mobile (22)
890-942 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 Radiolocation	890-902 FIXED MOBILE except aeronautical mobile 5.317A Radiolocation 5.318 5.325	890-942 FIXED MOBILE 5.317A BROADCASTING Radiolocation	890-902 US116 US268 G2	894-896 AERONAUTICAL MOBILE US116 US268	
				896-901 FIXED LAND MOBILE US116 US268	Private Land Mobile (90)
				901-902 FIXED MOBILE US116 US268	Personal Communications (24)
	902-928 FIXED Amateur Mobile except aeronautical mobile 5.325A Radiolocation 5.150 5.325 5.326		902-928 RADIOLOCATION G59 5.150 US215 US218 US267 US275 G11	902-928 5.150 US215 US218 US267 US275	ISM Equipment (18) Private Land Mobile (90) Amateur (97)
	928-942 FIXED MOBILE except aeronautical mobile 5.317A Radiolocation		928-932 US116 US215 US268 G2	928-929 FIXED US116 US215 US268 NG120	Public Mobile (22) Private Land Mobile (90) Fixed Microwave (101)
				929-930 FIXED LAND MOBILE US116 US215 US268	Private Land Mobile (90)
				930-931 FIXED MOBILE US116 US215 US268	Personal Communications (24)
				931-932 FIXED LAND MOBILE US116 US215 US268	Public Mobile (22)

			932-935 FIXED US215 US268 G2	932-935 FIXED US215 US268 NG120	Public Mobile (22) Fixed Microwave (101)
			935-940 US116 US215 US268 G2	935-940 FIXED LAND MOBILE US116 US215 US268	Private Land Mobile (90)
			940-941 US116 US268 G2	940-941 FIXED MOBILE US116 US268	Personal Communications (24)
5.323	5.325	5.327	941-944	941-944	
942-960 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 5.323	942-960 FIXED MOBILE 5.317A	942-960 FIXED MOBILE 5.317A BROADCASTING 5.320	FIXED US268 US301 US302 G2 944-960	FIXED US268 US301 US302 NG120 944-960 FIXED NG120	Public Mobile (22) Fixed Microwave (101) Public Mobile (22) Auxiliary Broadcasting (74) Fixed Microwave (101)
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1164-1215 AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.328A			1164-1215 AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328A US224		
1215-1240 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) 5.330 5.331 5.332			1215-1240 EARTH EXPLORATION- SATELLITE (active) RADIOLOCATION G56 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) G132 SPACE RESEARCH (active) 5.332	1215-1240 Earth exploration-satellite (active) Space research (active)	
1240-1300 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) Amateur 5.282 5.330 5.331 5.332 5.335 5.335A			1240-1300 AERONAUTICAL RADIONAVIGATION EARTH EXPLORATION- SATELLITE (active) RADIOLOCATION G56 SPACE RESEARCH (active) 5.332 5.335	1240-1300 AERONAUTICAL RADIONAVIGATION Earth exploration-satellite (active) Space research (active) Amateur 5.282	Amateur (97)
1300-1350 AERONAUTICAL RADIONAVIGATION 5.337 RADIOLOCATION RADIONAVIGATION-SATELLITE (Earth-to-space) 5.149 5.337A			1300-1350 AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation G2 US342	1300-1350 AERONAUTICAL RADIONAVIGATION 5.337 US342	Aviation (87)

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			1390-1395 5.339 US311 US342 US351 US398	1390-1392 FIXED MOBILE except aeronautical mobile Fixed-satellite (Earth-to-space) US368 5.339 US311 US342 US351 US398 1392-1395 FIXED MOBILE except aeronautical mobile 5.339 US311 US342 US351 US398	Wireless Communications (27)
5.149 5.338 5.339 5.339A	5.149 5.334 5.339 5.339A		1395-1400 LAND MOBILE (medical telemetry and medical telecommand) 5.339 US311 US342 US351 US398		Personal (95)
1400-1427 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341			1400-1427 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.341 US246		
1427-1429 SPACE OPERATION (Earth-to-space) FIXED MOBILE except aeronautical mobile 5.341			1427-1429.5 LAND MOBILE US350 5.341 US352 US398	1427-1429.5 LAND MOBILE Fixed (telemetry) 5.341 US350 US352 US398	Private Land Mobile (90) Personal (95)
1429-1452 FIXED MOBILE except aeronautical mobile	1429-1452 FIXED MOBILE 5.343		1429.5-1432 5.341 US350 US352 US398	1429.5-1430 FIXED (telemetry) LAND MOBILE (telemetry) 5.341 US350 US352 US398 1430-1432 FIXED (telemetry) LAND MOBILE (telemetry) Fixed-satellite (space-to-Earth) US368 5.341 US350 US352 US398	
			1432-1435 5.341 US361	1432-1435 FIXED MOBILE except aeronautical mobile 5.341 US361	Wireless Communications (27)

5.339A 5.341 5.342	5.339A 5.341		1435-1525 MOBILE (aeronautical telemetry)	Aviation (87)
1452-1492 FIXED MOBILE except aeronautical mobile BROADCASTING 5.345 5.347 BROADCASTING-SATELLITE 5.345 5.347 5.347A 5.341 5.342	1452-1492 FIXED MOBILE 5.343 BROADCASTING 5.345 5.347 BROADCASTING-SATELLITE 5.345 5.347 5.347A 5.341 5.344			
1492-1518 FIXED MOBILE except aeronautical mobile 5.341 5.342	1492-1518 FIXED MOBILE 5.343 5.341 5.344	1492-1518 FIXED MOBILE 5.341		
1518-1525 FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.348C 5.341 5.342	1518-1525 FIXED MOBILE 5.343 MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.348C 5.341 5.344	1518-1525 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.348 5.348A 5.348B 5.348C 5.341	5.341 US78	
1525-1530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.351A Earth exploration-satellite Mobile except aeronautical mobile 5.349 5.341 5.342 5.347A 5.350 5.351 5.352A 5.354	1525-1530 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.351A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.347A 5.351 5.354	1525-1530 SPACE OPERATION (space-to-Earth) FIXED MOBILE-SATELLITE (space-to-Earth) 5.351A Earth exploration-satellite Mobile 5.349 5.341 5.347A 5.351 5.352A 5.354	1525-1535 MOBILE-SATELLITE (space-to-Earth) US315 US380	Satellite Communications (25) Maritime (80)
1530-1535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.351A 5.353A Earth exploration-satellite Fixed Mobile except aeronautical mobile 5.341 5.342 5.347A 5.351 5.354	1530-1535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.351A 5.353A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.347A 5.351 5.354		5.341 5.351	
1535-1559 MOBILE-SATELLITE (space-to-Earth) 5.351A 5.341 5.347A 5.351 5.353A 5.354 5.355 5.356 5.357 5.357A 5.359 5.362A			1535-1559 MOBILE-SATELLITE (space-to-Earth) US308 US309 US315 US380 5.341 5.351 5.356	Satellite Communications (25) Maritime (80) Aviation (87)
1559-1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329A 5.341 5.362B 5.362C 5.363			1559-1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.341 US208 US260	Aviation (87)

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1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION 5.149 5.341 5.355 5.359 5.363 5.364 5.366 5.367 5.368 5.369 5.371 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION RADIODETERMINATION- SATELLITE (Earth-to-space) 5.149 5.341 5.364 5.366 5.367 5.368 5.370 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.149 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) US319 US380 RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE (Earth-to-space) 5.341 5.364 5.366 5.367 5.368 5.372 US208 US342		
1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.347A 5.341 5.355 5.359 5.363 5.364 5.365 5.366 5.367 5.368 5.369 5.371 5.372	1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION- SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.347A 5.341 5.364 5.365 5.366 5.367 5.368 5.370 5.372	1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.347A Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.372	1613.8-1626.5 MOBILE-SATELLITE (Earth-to-space) US319 US380 AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.341 5.364 5.365 5.366 5.367 5.368 5.372 US208		
1626.5-1660 MOBILE-SATELLITE (Earth-to-space) 5.351A 5.341 5.351 5.353A 5.354 5.355 5.357A 5.359 5.362A 5.374 5.375 5.376			1626.5-1660 MOBILE-SATELLITE (Earth-to-space) US308 US309 US315 US380 5.341 5.351 5.375		Satellite Communications (25) Maritime (80) Aviation (87)
1660-1660.5 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY 5.149 5.341 5.351 5.354 5.362A 5.376A			1660-1660.5 MOBILE-SATELLITE (Earth-to-space) US308 US309 US380 RADIO ASTRONOMY 5.341 5.351 US342		Satellite Communications (25) Aviation (87)
1660.5-1668 RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379 5.379A			1660.5-1668.4 RADIO ASTRONOMY US74 SPACE RESEARCH (passive)		

1668-1668.4 MOBILE-SATELLITE (Earth-to-space) 5.348C 5.379B 5.379C RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379 5.379A 5.379D			5.341 US246		
1668.4-1670 METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (Earth-to-space) 5.348C 5.379B 5.379C RADIO ASTRONOMY 5.149 5.341 5.379D 5.379E			1668.4-1670 METEOROLOGICAL AIDS (radiosonde) RADIO ASTRONOMY US74 5.341 US99 US342		
1670-1675 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE 5.380 MOBILE-SATELLITE (Earth-to-space) 5.348C 5.379B 5.341 5.379D 5.379E 5.380A			1670-1675 5.341 US211 US362	1670-1675 FIXED MOBILE except aeronautical mobile 5.341 US211 US362	Wireless Communications (27)
1675-1690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.341			1675-1700 METEOROLOGICAL AIDS (radiosonde) METEOROLOGICAL-SATELLITE (space-to-Earth)		
1690-1700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed Mobile except aeronautical mobile 5.289 5.341 5.382	1690-1700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) 5.289 5.341 5.381		5.289 5.341 US211		
1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341		1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341 5.384	1700-1710 FIXED G118 METEOROLOGICAL-SATELLITE (space-to-Earth) 5.289 5.341	1700-1710 METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed 5.289 5.341	
1710-1930 FIXED MOBILE 5.380 5.384A 5.388A 5.149 5.341 5.385 5.386 5.387 5.388			1710-1755 5.341 US311 US378 1755-1850 FIXED MOBILE SPACE OPERATION (Earth-to-space) G42	1710-1755 FIXED MOBILE 5.341 US311 US378 1755-1850	Wireless Communications (27)

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See previous page for 1710-1930 MHz			1850-2025	1850-2000 FIXED MOBILE NG177	RF Devices (15) Personal Communications (24) Fixed Microwave (101)
1930-1970 FIXED MOBILE 5.388A 5.388	1930-1970 FIXED MOBILE 5.388A Mobile-satellite (Earth-to-space) 5.388	1930-1970 FIXED MOBILE 5.388A 5.388			
1970-1980 FIXED MOBILE 5.388A 5.388					
1980-2010 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A 5.389B 5.389F				2000-2020 MOBILE-SATELLITE (Earth-to-space) US380 NG156	Satellite Communications (25)
2010-2025 FIXED MOBILE 5.388A 5.388	2010-2025 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.388 5.389C 5.389E 5.390	2010-2025 FIXED MOBILE 5.388A 5.388		2020-2025 FIXED MOBILE NG177	
2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space) 5.392			2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) SPACE RESEARCH (Earth-to-space) (space-to-space) 5.391 5.392 US90 US222 US346 US347 US393	2025-2110 FIXED NG118 MOBILE 5.391 5.392 US90 US222 US346 US347 US393	TV Auxiliary Broadcasting (74F) Cable TV Relay (78) Local TV Transmission (101J)
2110-2120 FIXED MOBILE 5.388A SPACE RESEARCH (deep space) (Earth-to-space) 5.388			2110-2120 US252	2110-2155 FIXED MOBILE US252	Domestic Public Fixed (21) Public Mobile (22) Wireless Communications (27) Fixed Microwave (101)
2120-2160 FIXED MOBILE 5.388A 5.388	2120-2160 FIXED MOBILE 5.388A Mobile-satellite (space-to-Earth) 5.388	2120-2170 FIXED MOBILE 5.388A	2120-2200	2155-2160 FIXED	Domestic Public Fixed (21) Fixed Microwave (101)
2160-2170 FIXED MOBILE 5.388A 5.388 5.392A	2160-2170 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.388 5.389C 5.389E 5.390	5.388		2160-2180 FIXED NG153 MOBILE	Domestic Public Fixed (21) Public Mobile (22) Fixed Microwave (101)

2170-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F 5.392A			NG178 2180-2200 MOBILE-SATELLITE (space-to-Earth) US380 NG168	 Satellite Communications (25)
2200-2290 SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392		2200-2290 SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED (line-of-sight only) MOBILE (line-of-sight only including aeronautical telemetry, but excluding flight testing of manned aircraft) 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392 US303	2200-2290 US303	
2290-2300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)		2290-2300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)	2290-2300 SPACE RESEARCH (deep space) (space-to-Earth)	
2300-2450 FIXED MOBILE Amateur Radiolocation	2300-2450 FIXED MOBILE RADIOLOCATION Amateur	2300-2305 G123	2300-2305 Amateur	Amateur (97)
		2305-2310 US338 G123	2305-2310 FIXED MOBILE except aeronautical mobile RADIOLOCATION Amateur US338	Wireless Communications (27) Amateur (97)
		2310-2320 Fixed Mobile US339 Radiolocation G2 G120 US327	2310-2320 FIXED MOBILE US339 RADIOLOCATION BROADCASTING-SATELLITE 5.396 US327	Wireless Communications (27) Aviation (87)
		2320-2345 Fixed Radiolocation G2 G120 US327	2320-2345 BROADCASTING-SATELLITE 5.396 US327	Satellite Communications (25)
		2345-2360 Fixed Mobile US339 Radiolocation G2 G120 US327	2345-2360 FIXED MOBILE US339 RADIOLOCATION BROADCASTING-SATELLITE 5.396 US327	Wireless Communications (27) Aviation (87)
5.150 5.282 5.395	5.150 5.282 5.393 5.394 5.396			

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See previous page for 2300-2450 MHz			2360-2390 MOBILE US276 RADIOLOCATION G2 G120 Fixed	2360-2390 MOBILE US276	Aviation (87)
			2390-2395 MOBILE US276	2390-2395 MOBILE US276 AMATEUR	Aviation (87) Amateur (97)
			2395-2400 G122	2395-2400 AMATEUR	Amateur (97)
			2400-2402 5.150 G123	2400-2417 AMATEUR	ISM Equipment (18) Amateur (97)
			2402-2417 5.150 G122	5.150 5.282	
			2417-2450 Radiolocation G2 5.150 G124	2417-2450 Amateur 5.150 5.282	
2450-2483.5 FIXED MOBILE Radiolocation 5.150 5.397	2450-2483.5 FIXED MOBILE RADIOLOCATION 5.150 5.394		2450-2483.5 5.150 US41	2450-2483.5 FIXED MOBILE Radiolocation 5.150 US41	ISM Equipment (18) TV Auxiliary Broadcast. (74F) Private Land Mobile (90) Fixed Microwave (101)
2483.5-2500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A Radiolocation	2483.5-2500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION RADIODETERMINATION-SATEL- LITE (space-to-Earth) 5.398	2483.5-2500 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A RADIOLOCATION Radiodetermination-satellite (space-to-Earth) 5.398	2483.5-2500 MOBILE-SATELLITE (space- to-Earth) US319 US380 US391 RADIODETERMINATION- SATELLITE (space-to-Earth) 5.398	2483.5-2495 MOBILE-SATELLITE (space-to- Earth) US319 US380 RADIODETERMINATION- SATELLITE (space-to-Earth) 5.398 5.150 5.402 US41 NG147	ISM Equipment (18) Satellite Communications (25)
				2495-2500 FIXED MOBILE except aeronautical mobile MOBILE-SATELLITE (space-to- Earth) US319 US380 RADIODETERMINATION- SATELLITE (space-to-Earth) 5.398	ISM Equipment (18) Satellite Communications (25) Wireless Communications (27)
5.150 5.371 5.397 5.398 5.399 5.400 5.402	5.150 5.402	5.150 5.400 5.402	5.150 5.402 US41	5.150 5.402 US41 US391 NG147	
2500-2520 FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (space-to-Earth) 5.351A 5.403 5.405 5.407 5.412 5.414	2500-2520 FIXED 5.409 5.411 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (space-to-Earth) 5.351A 5.403 5.404 5.407 5.414 5.415A		2500-2655	2500-2655 FIXED US205 MOBILE except aeronautical mobile	Wireless Communications (27)

2520-2655 FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.403 5.405 5.412 5.417C 5.417D 5.418B 5.418C	2520-2655 FIXED 5.409 5.411 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.403 5.417C 5.417D 5.418B 5.418C	2520-2535 FIXED 5.409 5.411 FIXED-SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.403 5.415A 2535-2655 FIXED 5.409 5.411 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.417A 5.417B 5,417C 5.417D 5.418 5.418A 5.418B 5.418C	5.339 US205	5.339	
2655-2670 FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.347A 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.412 5.420	2655-2670 FIXED 5.409 5.411 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.347A 5.420	2655-2670 FIXED 5.409 5.411 FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.347A 5.413 5.416 Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.420	2655-2690 Earth exploration-satellite (passive) Radio astronomy US269 Space research (passive)	2655-2690 FIXED US205 MOBILE except aeronautical mobile Earth exploration-satellite (passive) Radio astronomy Space research (passive)	
2670-2690 FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.412 5.419 5.420	2670-2690 FIXED 5.409 5.411 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.347A 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.419 5.420	2670-2690 FIXED 5.409 5.411 FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A Earth exploration-satellite (passive) Radio astronomy Space research (passive) 5.149 5.419 5.420 5.420A	US205	US269	
2690-2700 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.422			2690-2700 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive) US246		

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2900-3100 RADIOLOCATION 5.424A RADIONAVIGATION 5.426 5.425 5.427			2900-3100 RADIOLOCATION 5.424A G56 MARITIME RADIONAVIGATION 5.427 US44 US316	2900-3100 MARITIME RADIONAVIGATION Radiolocation US44 5.5427 US316	Maritime (80) Private Land Mobile (90)
3100-3300 RADIOLOCATION Earth exploration-satellite (active) Space research (active) 5.149 5.428			3100-3300 RADIOLOCATION G59 Earth exploration-satellite (active) Space research (active) US342	3100-3300 Radiolocation Earth exploration-satellite (active) Space research (active) US342	Private Land Mobile (90)
3300-3400 RADIOLOCATION 5.149 5.429 5.430	3300-3400 RADIOLOCATION Amateur Fixed Mobile 5.149 5.430	3300-3400 RADIOLOCATION Amateur 5.149 5.429	3300-3500 RADIOLOCATION US108 G31 US342	3300-3500 Amateur Radiolocation US108 5.282 US342	Private Land Mobile (90) Amateur (97)
3400-3600 FIXED FIXED-SATELLITE (space-to-Earth) Mobile Radiolocation 5.431	3400-3500 FIXED FIXED-SATELLITE (space-to-Earth) Amateur Mobile Radiolocation 5.433 5.282 5.432 3500-3700 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile Radiolocation 5.433		3500-3650 RADIOLOCATION G59 AERONAUTICAL RADIONAVIGATION (ground-based) G110 US245	3500-3600 Radiolocation 3600-3650 FIXED-SATELLITE (space-to-Earth) US245 Radiolocation	Private Land Mobile (90)
3600-4200 FIXED FIXED-SATELLITE (space-to-Earth) Mobile			3650-3700 US348 US349	3650-3700 FIXED FIXED-SATELLITE (space-to-Earth) NG169 NG185 MOBILE except aeronautical mobile US348 US349	Satellite Communications (25) Private Land Mobile (90)
	5.435 3700-4200 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile		3700-4200	3700-4200 FIXED NG41 FIXED-SATELLITE (space-to-Earth) NG180	International Fixed (23) Satellite Communications (25) Fixed Microwave (101)

4200-4400 AERONAUTICAL RADIONAVIGATION 5.438 5.437 5.439 5.440	4200-4400 AERONAUTICAL RADIONAVIGATION 5.440 US261		Aviation (87)
4400-4500 FIXED MOBILE	4400-4500 FIXED MOBILE	4400-4500	
4500-4800 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE	4500-4800 FIXED MOBILE US245	4500-4800 FIXED-SATELLITE (space-to-Earth) 5.441 US245	
4800-4990 FIXED MOBILE 5.442 Radio astronomy	4800-4940 FIXED MOBILE US203 US342	4800-4940 US203 US342	
	4940-4990	4940-4990 FIXED MOBILE except aeronautical mobile	Private Land Mobile (90) Fixed Microwave (101)
5.149 5.339 5.443	5.339 US311 US342 G122	5.339 US311 US342	
4990-5000 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY Space research (passive) 5.149	4990-5000 RADIO ASTRONOMY US74 Space research (passive) US246		
5000-5010 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (Earth-to-space) 5.367	5000-5010 AERONAUTICAL RADIONAVIGATION US260 RADIONAVIGATION-SATELLITE (Earth-to-space) 5.367 US211 US344		Satellite Communications (25) Aviation (87)
5010-5030 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.443B 5.367	5010-5030 AERONAUTICAL RADIONAVIGATION US260 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.443B 5.367 US211 US344		
5030-5150 AERONAUTICAL RADIONAVIGATION 5.367 5.444 5.444A	5030-5250 AERONAUTICAL RADIONAVIGATION US260	5030-5150 AERONAUTICAL RADIONAVIGATION US260 5.367 5.444 5.444A US211 US344	
5150-5250 AERONAUTICAL RADIONAVIGATION FIXED-SATELLITE (Earth-to-space) 5.447A MOBILE except aeronautical mobile 5.446A 5.446B 5.446 5.447 5.447B 5.447C	5.367 5.444 US211 US307 US344	5150-5250 AERONAUTICAL RADIONAVIGATION US260 FIXED-SATELLITE (Earth-to-space) 5.447A US344 5.447C US211 US307	RF Devices (15) Satellite Communications (25) Aviation (87)

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5255-5350 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) MOBILE except aeronautical mobile 5.446A 5.447F 5.447E 5.448 5.448A			5255-5350 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION G59 SPACE RESEARCH (active) 5.448A	5255-5350 Earth exploration-satellite (active) Radiolocation Space research (active) 5.448A	
5350-5460 EARTH EXPLORATION-SATELLITE (active) 5.448B SPACE RESEARCH (active) 5.448C AERONAUTICAL RADIONAVIGATION 5.449 RADIOLOCATION 5.448D			5350-5460 EARTH EXPLORATION-SATELLITE (active) 5.448B SPACE RESEARCH (active) AERONAUTICAL RADIONAVIGATION 5.449 RADIOLOCATION G56 US390 G130	5350-5460 AERONAUTICAL RADIONAVIGATION 5.449 Earth exploration-satellite (active) 5.448B Space research (active) Radiolocation US390	Aviation (87) Private Land Mobile (90)
5460-5470 RADIONAVIGATION 5.449 EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.448D 5.448B			5460-5470 RADIONAVIGATION 5.449 US65 EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION G56 5.448B US49 G130	5460-5470 RADIONAVIGATION 5.449 US65 Earth exploration-satellite (active) Space research (active) Radiolocation 5.448B US49	Private Land Mobile (90)
5470-5570 MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION 5.450B 5.448B 5.450 5.451 5.452			5470-5570 MARITIME RADIONAVIGATION US65 EARTH EXPLORATION-SATELLITE (active) SPACE RESEARCH (active) RADIOLOCATION G56 5.448B US50 G131	5470-5570 MARITIME RADIONAVIGATION US65 RADIOLOCATION Earth exploration-satellite (active) Space research (active) US50	RF Devices (15) Maritime (80) Private Land Mobile (90)
5570-5650 MARITIME RADIONAVIGATION MOBILE except aeronautical mobile 5.446A 5.450A RADIOLOCATION 5.450B 5.450 5.451 5.452			5570-5600 MARITIME ADIONAVIGATION US65 RADIOLOCATION G56 US50 G131 5600-5650 MARITIME ADIONAVIGATION US65 METEOROLOGICAL AIDS RADIOLOCATION G56 5.452 US50 G131	5570-5600 MARITIME RADIONAVIGATION US65 RADIOLOCATION US50 5600-5650 MARITIME RADIONAVIGATION US65 METEOROLOGICAL AIDS RADIOLOCATION 5.452 US50	

5650-5725 RADIOLOCATION MOBILE except aeronautical mobile 5.446A 5.450A Amateur Space research (deep space) 5.282 5.451 5.453 5.454 5.455			5650-5925 RADIOLOCATION G2	5650-5830 Amateur 5.150 5.282	RF Devices (15) ISM Equipment (18) Amateur (97)
5725-5830 FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur 5.150 5.451 5.453 5.455 5.456	5725-5830 RADIOLOCATION Amateur 5.150 5.453 5.455				
5830-5850 FIXED-SATELLITE (Earth-to-space) RADIOLOCATION Amateur Amateur-satellite (space-to-Earth) 5.150 5.451 5.453 5.455 5.456	5830-5850 RADIOLOCATION Amateur Amateur-satellite (space-to-Earth) 5.150 5.453 5.455			5830-5850 Amateur Amateur-satellite (space-to-Earth) 5.150	ISM Equipment (18) Amateur (97)
5850-5925 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.150	5850-5925 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Amateur Radiolocation 5.150	5850-5925 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE Radiolocation 5.150	5.150 US245	5850-5925 FIXED-SATELLITE (Earth-to-space) US245 MOBILE NG160 Amateur 5.150	ISM Equipment (18) Private Land Mobile (90) Personal Radio (95) Amateur (97)
5925-6700 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B MOBILE 5.149 5.440 5.458			5925-6425	5925-6425 FIXED NG41 FIXED-SATELLITE (Earth-to-space) NG181	International Fixed (23) Satellite Communications (25) Fixed Microwave (101)
			6425-6525 5.440 5.458	6425-6525 FIXED-SATELLITE (Earth-to-space) MOBILE 5.440 5.458	Auxiliary Broadcasting (74) Cable TV Relay (78) Fixed Microwave (101)
			6525-6700 5.458 US342	6525-6700 FIXED FIXED-SATELLITE (Earth-to-space) 5.458 US342	Satellite Communications (25) Fixed Microwave (101)

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				6875-7025 FIXED NG118 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441 MOBILE NG171 5.458 5.458A 5.458B	Satellite Communications (25) Auxiliary Broadcasting (74) Cable TV Relay (78)
				7025-7075 FIXED NG118 FIXED-SATELLITE (Earth-to-space) NG172 MOBILE NG171 5.458 5.458A 5.458B	
7075-7145 FIXED MOBILE				7075-7125 FIXED NG118 MOBILE NG171	Auxiliary Broadcasting (74) Cable TV Relay (78)
			5.458	5.458	
			7125-7145 FIXED	7125-7190	
5.458 5.459			5.458 G116		
7145-7235 FIXED MOBILE SPACE RESEARCH (Earth-to-space) 5.460			7145-7190 FIXED SPACE RESEARCH (deep space) (Earth-to-space) US262		
			5.458 G116	5.458 US262	
			7190-7235 FIXED SPACE RESEARCH (Earth-to-space) G133	7190-7250	
5.458 5.459			5.458		
7235-7250 FIXED MOBILE			7235-7250 FIXED		
5.458			5.458	5.458	
7250-7300 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE			7250-7300 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Fixed	7250-8025	
5.461			G117		

7300-7450 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.461	7300-7450 FIXED FIXED-SATELLITE (space-to-Earth) Mobile-satellite (space-to-Earth) G117		
7450-7550 FIXED FIXED-SATELLITE (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.461A	7450-7550 FIXED FIXED-SATELLITE (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) Mobile-satellite (space-to-Earth) G104 G117		
7550-7750 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 	7550-7750 FIXED FIXED-SATELLITE (space-to-Earth) Mobile-satellite (space-to-Earth) G117		
7750-7850 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) 5.461B MOBILE except aeronautical mobile 	7750-7850 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) 5.461B		
7850-7900 FIXED MOBILE except aeronautical mobile	7850-7900 FIXED		
7900-8025 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.461	7900-8025 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Fixed G117		
8025-8175 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	8025-8175 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) Mobile-satellite (Earth-to-space) (no airborne transmissions) US258 G117	8025-8215	
8175-8215 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	8175-8215 EARTH EXPLORATION- SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Mobile-satellite (Earth-to-space) (no airborne transmissions) US258 G104 G117	US258	

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8400-8500 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-Earth) 5.465 5.466			8400-8450 FIXED SPACE RESEARCH (space-to-Earth) (deep space only)	8400-8450 Space research (space-to-Earth) (deep space only)	
			8450-8500 FIXED SPACE RESEARCH (space-to-Earth)	8450-8500 SPACE RESEARCH (space-to-Earth)	
8500-8550 RADIOLOCATION 5.468 5.469			8500-8550 RADIOLOCATION G59	8500-8550 Radiolocation	
8550-8650 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.468 5.469 5.469A			8550-8650 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION G59 SPACE RESEARCH (active)	8550-8650 Earth exploration-satellite (active) Radiolocation Space research (active)	
8650-8750 RADIOLOCATION 5.468 5.469			8650-9000 RADIOLOCATION G59	8650-9000 Radiolocation	
8750-8850 RADIOLOCATION AERONAUTICAL RADIONAVIGATION 5.470 5.471					
8850-9000 RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.473			 US53	 US53	
9000-9200 AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation 5.471			9000-9200 AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation G2 US48 G19	9000-9200 AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation US48	Aviation (87)
9200-9300 RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.473 5.474			9200-9300 MARITIME RADIONAVIGATION 5.472 Radiolocation US110 G59 5.474	9200-9300 MARITIME RADIONAVIGATION 5.472 Radiolocation US110 5.474	

9300-9500 RADIONAVIGATION 5.476 Radiolocation 5.427 5.474 5.475	9300-9500 RADIONAVIGATION 5.476 US66 Radiolocation US51 G56 Meteorological aids 5.427 5.474 US67 US71	9300-9500 RADIONAVIGATION 5.476 US66 Radiolocation US51 Meteorological aids 5.427 5.474 US67 US71	
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10.45-10.5 RADIOLOCATION Amateur Amateur-satellite 5.481			10.45-10.5 RADIOLOCATION G32 US58 US108	10.45-10.5 Radiolocation Amateur Amateur-satellite US58 US108 NG42 NG134	
10.5-10.55 FIXED MOBILE Radiolocation	10.5-10.55 FIXED MOBILE RADIOLOCATION		10.5-10.55 RADIOLOCATION US59		Private Land Mobile (90)
10.55-10.6 FIXED MOBILE except aeronautical mobile Radiolocation			10.55-10.6	10.55-10.6 FIXED	Fixed Microwave (101)
10.6-10.68 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation 5.149 5.482			10.6-10.68 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) US265 US277	10.6-10.68 EARTH EXPLORATION-SATELLITE (passive) FIXED US265 SPACE RESEARCH (passive) US277	
10.68-10.7 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.483			10.68-10.7 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive) US246 US355		
10.7-11.7 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 5.484A (Earth-to-space) 5.484 MOBILE except aeronautical mobile	10.7-11.7 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 5.484A MOBILE except aeronautical mobile		10.7-11.7 US211	10.7-11.7 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 US211 US355 NG104 NG182	Satellite Communications (25) Fixed Microwave (101)
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5.487 5.487A 5.492	12.2-12.7 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE	12.2-12.5 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile BROADCASTING 5.484A 5.487		12.2-12.7 FIXED BROADCASTING-SATELLITE	Satellite Communications (25) Fixed Microwave (101)
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13.75-14 FIXED-SATELLITE (Earth-to-space) 5.484A RADIOLOCATION Earth exploration-satellite Standard frequency and time signal-satellite (Earth-to-space) Space research 5.499 5.500 5.501 5.502 5.503			13.75-14 RADIOLOCATION G59 Standard frequency and time signal-satellite (Earth-to-space) Space research US337 US356 US357	13.75-14 FIXED-SATELLITE (Earth-to-space) US337 Radiolocation Standard frequency and time signal-satellite (Earth-to-space) Space research US356 US357	Satellite Communications (25) Private Land Mobile (90)

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14.25-14.3 FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B RADIONAVIGATION 5.504 Mobile-satellite (Earth-to-space) 5.506A 5.508A Space research 5.504A 5.505 5.508 5.509			14.2-14.4	14.2-14.47 FIXED-SATELLITE (Earth-to-space) NG183 Mobile-satellite (Earth-to-space)	Satellite Communications (25)
14.3-14.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.506A 5.509A Radionavigation-satellite 5.504A	14.3-14.4 FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 5.506B Mobile-satellite (Earth-to-space) 5.506A Radionavigation-satellite 5.504A	14.3-14.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.506A 5.509A Radionavigation-satellite 5.504A			
14.4-14.47 FIXED FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B 5.484A 5.506 5.506B MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.506A 5.509A Space research (space-to-Earth) 5.504A			14.4-14.47 Fixed Mobile	NG184	
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15.35-15.4 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.511			15.35-15.4 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive) US246		
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15.63-15.7 AERONAUTICAL RADIONAVIGATION 5.511D			15.63-15.7 AERONAUTICAL RADIONAVIGATION US260 US211		Aviation (87)
15.7-16.6 RADIOLOCATION 5.512 5.513			15.7-16.6 RADIOLOCATION G59	15.7-17.2 Radiolocation	Private Land Mobile (90)
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17.1-17.2 RADIOLOCATION 5.512 5.513			17.1-17.2 RADIOLOCATION G59		
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17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 (space-to-Earth) 5.516A 5.516B Radiolocation 5.514	17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 BROADCASTING-SATELLITE Radiolocation 5.514 5.515 5.517	17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 Radiolocation 5.514	17.3-17.7 Radiolocation US259 G59	17.3-17.7 FIXED-SATELLITE (Earth-to-space) US271 BROADCASTING-SATELLITE NG163 NG167 US259	Satellite Communications (25)

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	17.8-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE		17.8-18.3 FIXED-SATELLITE (space-to-Earth) G117 5.519 US334	17.8-18.3 FIXED 5.519 US334 NG144	Auxiliary Broadcasting (74) Cable TV Relay (78) Fixed Microwave (101)
18.1-18.4 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B (Earth-to-space) 5.520 MOBILE 5.519 5.521			18.3-18.6 FIXED-SATELLITE (space-to-Earth) G117	18.3-18.6 FIXED-SATELLITE (space-to-Earth) NG164	Satellite Communications (25)
18.4-18.6 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE			US334	US334 NG144	
18.6-18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A 5.522C	18.6-18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.516B 5.522B MOBILE except aeronautical mobile SPACE RESEARCH (passive) 5.522A	18.6-18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A	18.6-18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED-SATELLITE (space-to-Earth) US255 G117 SPACE RESEARCH (passive) US254 US334	18.6-18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED-SATELLITE (space-to-Earth) US255 NG164 SPACE RESEARCH (passive) US254 US334 NG144	
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19.3-19.7 FIXED FIXED-SATELLITE (space-to-Earth) (Earth-space) 5.523B 5.523C 5.523D 5.523E MOBILE				19.3-19.7 FIXED FIXED-SATELLITE (space-to-Earth) NG166 US334 NG144	Satellite Communications (25) Auxiliary Broadcasting (74) Cable TV Relay (78) Fixed Microwave (101)
19.7-20.1 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B Mobile-satellite (space-to-Earth) 5.524	19.7-20.1 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE-SATELLITE (space-to-Earth) 5.524 5.525 5.526 5.527 5.528 5.529	19.7-20.1 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B Mobile-satellite (space-to-Earth) 5.524		19.7-20.1 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.525 5.526 5.527 5.528 5.529 US334	Satellite Communications (25)

20.1-20.2 FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B MOBILE-SATELLITE (space-to-Earth) 5.524 5.525 5.526 5.527 5.528				20.1-20.2 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.525 5.526 5.527 5.528 US334	
20.2-21.2 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Standard frequency and time signal-satellite (space-to-Earth) 5.524				20.2-21.2 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Standard frequency and time signal-satellite (space-to-Earth) G117	20.2-21.2 Standard frequency and time signal-satellite (space-to-Earth)	
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22-22.21 FIXED MOBILE except aeronautical mobile 5.149				22-22.21 FIXED MOBILE except aeronautical mobile US342		
22.21-22.5 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) 5.149 5.532				22.21-22.5 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) US342 US263		
22.5-22.55 FIXED MOBILE				22.5-22.55 FIXED MOBILE US211		
22.55-23.55 FIXED INTER-SATELLITE MOBILE 5.149				22.55-23.55 FIXED INTER-SATELLITE US278 MOBILE US342		Satellite Communications (25) Fixed Microwave (101)
23.55-23.6 FIXED MOBILE				23.55-23.6 FIXED MOBILE		Fixed Microwave (101)

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24.05-24.25 RADIOLOCATION Amateur Earth exploration-satellite (active) 5.150			24.05-24.25 RADIOLOCATION G59 Earth exploration-satellite (active) 5.150	24.05-24.25 Amateur Earth exploration-satellite (active) Radiolocation 5.150	ISM Equipment (18) Private Land Mobile (90) Amateur (97)
24.25-24.45 FIXED	24.25-24.45 RADIONAVIGATION	24.25-24.45 RADIONAVIGATION FIXED MOBILE	24.25-24.45	24.25-24.45 FIXED	Fixed Microwave (101)
24.45-24.75 FIXED INTER-SATELLITE	24.45-24.65 INTER-SATELLITE RADIONAVIGATION 5.533	24.45-24.65 FIXED INTER-SATELLITE MOBILE RADIONAVIGATION 5.533	24.45-24.65 INTER-SATELLITE RADIONAVIGATION 5.533		Satellite Communications (25)
	24.65-24.75 INTER-SATELLITE RADIOLOCATION-SATELLITE (Earth-to-space)	24.65-24.75 FIXED INTER-SATELLITE MOBILE 5.533	24.65-24.75 INTER-SATELLITE RADIOLOCATION-SATELLITE (Earth-to-space)		
24.75-25.25 FIXED	24.75-25.25 FIXED-SATELLITE (Earth-to-space) 5.535	24.75-25.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.535 MOBILE	24.75-25.05 RADIONAVIGATION	24.75-25.05 FIXED-SATELLITE (Earth-to-space) NG167 RADIONAVIGATION	Satellite Communications (25) Aviation (87)
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25.25-25.5 FIXED INTER-SATELLITE 5.536 MOBILE Standard frequency and time signal-satellite (Earth-to-space)			25.25-25.5 FIXED INTER-SATELLITE 5.536 MOBILE Standard frequency and time signal-satellite (Earth-to-space)	25.25-25.5 Inter-satellite 5.536 Standard frequency and time signal-satellite (Earth-to-space)	Satellite Communications (25)

25.5-27 EARTH EXPLORATION-SATELLITE (space-to-Earth) 5.536B FIXED INTER-SATELLITE 5.536 MOBILE SPACE RESEARCH (space-to-Earth) 5.536C Standard frequency and time signal-satellite (Earth-to-space) 5.536A			25.5-27 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED INTER-SATELLITE 5.536 MOBILE SPACE RESEARCH (space-to-Earth) Standard frequency and time signal-satellite (Earth-to-space) 5.536A US258	25.5-27 Inter-satellite 5.536 Standard frequency and time signal-satellite (Earth-to-space) 5.536A US258	
27-27.5 FIXED INTER-SATELLITE 5.536 MOBILE	27-27.5 FIXED FIXED-SATELLITE (Earth-to-space) INTER-SATELLITE 5.536 5.537 MOBILE		27-27.5 FIXED INTER-SATELLITE 5.536 MOBILE	27-27.5 Inter-satellite 5.536	
27.5-28.5 FIXED 5.537A FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 MOBILE 5.538 5.540			27.5-30	27.5-29.5 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE	Satellite Communications (25) Fixed Microwave (101)
28.5-29.1 FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.523A 5.539 MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540					
29.1-29.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.516B 5.523C 5.523E 5.535A 5.539 5.541A MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540					
29.5-29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space) 5.540 5.542	29.5-29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) 5.541 5.525 5.526 5.527 5.529 5.540 5.542	29.5-29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space) 5.540 5.542		29.5-29.9 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) 5.525 5.526 5.527 5.529	Satellite Communications (25)
29.9-30 FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) 5.541 5.543 5.525 5.526 5.527 5.538 5.540 5.542				29.9-30 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) 5.525 5.526 5.527 5.543	

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31-31.3 FIXED 5.543A MOBILE Standard frequency and time signal-satellite (space-to-Earth) Space research 5.544 5.545 5.149			31-31.3 Standard frequency and time signal-satellite (space-to-Earth) US211 US342	31-31.3 FIXED MOBILE Standard frequency and time signal-satellite (space-to-Earth) US211 US342	Fixed Microwave (101)
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31.5-31.8 EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.546	31.5-31.8 EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	31.5-31.8 EARTH EXPLORATION- SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149	US246		
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40-40.5 EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) 5.516B MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)			40-40.5 EARTH EXPLORATION- SATELLITE (Earth-to-space) FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth) G117	40-40.5 FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth)	Satellite Communications (25)
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78-79 RADIOLOCATION Amateur Amateur-satellite Radio astronomy Space research (space-to-Earth) 5.149 5.560			78-79 RADIOLOCATION RADIO ASTRONOMY Space research (space-to-Earth) 5.560 US342	78-79 RADIOLOCATION RADIO ASTRONOMY Amateur Amateur-satellite Space research (space-to-Earth) 5.560 US342	
79-81 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth) 5.149			79-81 RADIO ASTRONOMY RADIOLOCATION Space research (space-to-Earth) US342	79-81 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth) US342	

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200-209 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341 5.563A	200-209 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive) 5.341 5.563A US246	
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217-226 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.149 5.341	217-226 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY SPACE RESEARCH (passive) 5.562B 5.341 US342	
226-231.5 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	226-231.5 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) US246	
231.5-232 FIXED MOBILE Radiolocation	231.5-232 FIXED MOBILE Radiolocation	
232-235 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation	232-235 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Radiolocation	
235-238 EARTH EXPLORATION-SATELLITE (passive) FIXED-SATELLITE (space-to-Earth) SPACE RESEARCH (passive) 5.563A 5.563B	235-238 EARTH EXPLORATION-SATELLITE (passive) FIXED-SATELLITE (space-to-Earth) SPACE RESEARCH (passive) 5.563A 5.563B	

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
238-240 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE RADIOLOCATION RADIONAVIGATION RADIONAVIGATION-SATELLITE			238-240 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE RADIOLOCATION RADIONAVIGATION RADIONAVIGATION-SATELLITE		
240-241 FIXED MOBILE RADIOLOCATION			240-241 FIXED MOBILE RADIOLOCATION		
241-248 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite 5.138 5.149			241-248 RADIO ASTRONOMY RADIOLOCATION 5.138 US342	241-248 RADIO ASTRONOMY RADIOLOCATION Amateur Amateur-satellite 5.138 US342	ISM Equipment (18) Amateur (97)
248-250 AMATEUR AMATEUR-SATELLITE Radio astronomy 5.149			248-250 Radio astronomy US342	248-250 AMATEUR AMATEUR-SATELLITE Radio astronomy US342	Amateur (97)
250-252 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.563A			250-252 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive) 5.563A US246		
252-265 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.149 5.554			252-265 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554 US211 US342		
265-275 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.149 5.563A			265-275 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.563A US342		
275-1000 (Not allocated) 5.565			275-1000 (Not allocated) 5.565		Amateur (97)

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INTERNATIONAL FOOTNOTES

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5.56 The stations of services to which the bands 14-19.95 kHz and 20.05-70 kHz and in Region 1 also the bands 72-84 kHz and 86-90 kHz are allocated may transmit standard frequency and time signals. Such stations shall be afforded protection from harmful interference. In Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Kazakhstan, Mongolia, Kyrgyzstan, Slovakia, the Czech Rep., Tajikistan and Turkmenistan, the frequencies 25 kHz and 50 kHz will be used for this purpose under the same conditions.

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5.58 Additional allocation: in Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan, the band 67-70 kHz is also allocated to the radionavigation service on a primary basis.

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5.68 Alternative allocation: in Angola, Burundi, Congo (Rep. of the), Malawi, the Dem. Rep. of the Congo, Rwanda and South Africa, the band 160-200 kHz is allocated to the fixed service on a primary basis.

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5.70 Alternative allocation: in Angola, Botswana, Burundi, Cameroon, the Central African Rep., Congo (Rep. of the), Ethiopia, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Oman, the Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland, Tanzania, Chad, Zambia and Zimbabwe, the band 200-283.5 kHz is allocated to the aeronautical radionavigation service on a primary basis.

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5.79A When establishing coast stations in the NAVTEX service on the frequencies 490 kHz, 518 kHz and 4209.5 kHz, administrations are strongly recommended to coordinate the operating characteristics in accordance with the procedures of the International Maritime Organization (IMO) (see Resolution 339 (Rev.WRC-97))[3].

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5.82 In the maritime mobile service, the frequency 490 kHz is, from the date of full implementation of the GMDSS (see Resolution 331 (Rev.WRC-97))[3], to be used exclusively for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships, by means of narrow-band direct-printing telegraphy. The conditions for use of the frequency 490 kHz are prescribed in Articles 31 and 52. In using the band 415-495 kHz for the aeronautical radionavigation service, administrations are requested to ensure that no harmful interference is caused to the frequency 490 kHz.

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5.87 Additional allocation: in Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland and Zimbabwe, the band 526.5-535 kHz is also allocated to the mobile service on a secondary basis.

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5.96 In Germany, Armenia, Austria, Azerbaijan, Belarus, Denmark, Estonia, the Russian Federation, Finland, Georgia, Hungary, Ireland, Iceland, Israel, Kazakhstan, Latvia, Liechtenstein, Lithuania, Malta, Moldova, Norway, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., the United Kingdom, Sweden, Switzerland, Tajikistan, Turkmenistan and Ukraine, administrations may allocate up to 200 kHz

[3] Note by the Secretariat: This Resolution was revised by WRC-03.

to their amateur service in the bands 1715-1800 kHz and 1850-2000 kHz. However, when allocating the bands within this range to their amateur service, administrations shall, after prior consultation with administrations of neighbouring countries, take such steps as may be necessary to prevent harmful interference from their amateur service to the fixed and mobile services of other countries. The mean power of any amateur station shall not exceed 10 W.

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5.98 Alternative allocation: in Angola, Armenia, Azerbaijan, Belarus, Belgium, Bulgaria, Cameroon, Congo (Rep. of the), Denmark, Egypt, Eritrea, Spain, Ethiopia, the Russian Federation, Georgia, Greece, Italy, Kazakhstan, Lebanon, Lithuania, Moldova, the Syrian Arab Republic, Kyrgyzstan, Somalia, Tajikistan, Tunisia, Turkmenistan, Turkey and Ukraine, the band 1810-1830 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.99 Additional allocation: in Saudi Arabia, Austria, Bosnia and Herzegovina, Iraq, the Libyan Arab Jamahiriya, Uzbekistan, Slovakia, Romania, Serbia and Montenegro, Slovenia, Chad, and Togo, the band 1810-1830 kHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

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5.107 Additional allocation: in Saudi Arabia, Eritrea, Ethiopia, Iraq, the Libyan Arab Jamahiriya, Lesotho, Somalia and Swaziland, the band 2160-2170 kHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis. The mean power of stations in these services shall not exceed 50 W.

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5.112 Alternative allocation: in Bosnia and Herzegovina, Denmark, Malta, Serbia and Montenegro, and Sri Lanka, the band 2194-2300 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

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5.114 Alternative allocation: in Bosnia and Herzegovina, Denmark, Iraq, Malta, and Serbia and Montenegro, the band 2502-2625 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

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5.117 Alternative allocation: in Bosnia and Herzegovina, Côte d'Ivoire, Denmark, Egypt, Liberia, Malta, Serbia and Montenegro, Sri Lanka and Togo, the band 3155-3200 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.118 Additional allocation: in the United States, Mexico, Peru and Uruguay, the band 3230-3400 kHz is also allocated to the radiolocation service on a secondary basis.

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5.134 The use of the bands 5900-5950 kHz, 7300-7350 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13570-13600 kHz, 13800-13870 kHz, 15600-15800 kHz, 17480-17550 kHz and 18900-19020 kHz by the broadcasting service as from 1 April 2007 is subject to the application of the procedure of Article 12. Administrations are encouraged to use these bands to facilitate the introduction of digitally modulated emissions in accordance with the provisions of Resolution 517 (Rev.WRC-03).

5.136 The band 5900-5950 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis, as well as to the following services: in Region 1 to the land mobile service on a primary basis, in Region 2 to the mobile except aeronautical mobile (R) service on a primary basis, and in Region 3 to the mobile except aeronautical mobile (R) service on a secondary basis, subject to application of the

procedure referred to in Resolution 21 (Rev.WRC-95)[3]. After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

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5.138A Until 29 March 2009, the band 6765-7000 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis. After this date, this band is allocated to the fixed and the mobile except aeronautical mobile (R) services on a primary basis.

5.139 Different category of service: until 29 March 2009, in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Latvia, Lithuania, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 6765-7000 kHz to the land mobile service is on a primary basis (see No. 5.33).

5.140 Additional allocation: in Angola, Iraq, Kenya, Rwanda, Somalia and Togo, the band 7000-7050 kHz is also allocated to the fixed service on a primary basis.

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5.141A Additional allocation: in Uzbekistan and Kyrgyzstan, the bands 7000-7100 kHz and 7100-7200 kHz are also allocated to the fixed and land mobile services on a secondary basis.

5.141B Additional allocation: after 29 March 2009, in Algeria, Saudi Arabia, Australia, Bahrain, Botswana, Brunei Darussalam, China, Comoros, Korea (Rep. of), Diego Garcia, Djibouti, Egypt, United Arab Emirates, Eritrea, Indonesia, Iran (Islamic Republic of), Japan, Jordan, Kuwait, the Libyan Arab Jamahiriya, Morocco, Mauritania, New Zealand, Oman, Papua New Guinea, Qatar, the Syrian Arab Republic, Singapore, Sudan, Tunisia, Viet Nam and Yemen, the band 7100-7200 kHz is also allocated to the fixed and the mobile, except aeronautical mobile (R), services on a primary basis.

5.141C In Regions 1 and 3, the band 7100-7200 kHz is allocated to the broadcasting service until 29 March 2009 on a primary basis.

5.142 Until 29 March 2009, the use of the band 7100-7300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. After 29 March 2009 the use of the band 7200-7300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3.

5.143 The band 7300-7350 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis and to the land mobile service on a secondary basis, subject to application of the procedure referred to in Resolution 21 (Rev.WRC-95)[3]. After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.143A In Region 3, the band 7350-7450 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

[3] Note by the Secretariat: This Resolution was revised by WRC-03.

5.143B In Region 1, the band 7350-7450 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, on condition that harmful interference is not caused to the broadcasting service, frequencies in the band 7350-7450 kHz may be used by stations in the fixed and land mobile services communicating only within the boundary of the country in which they are located, each station using a total radiated power that shall not exceed 24 dBW.

5.143C Additional allocation: after 29 March 2009 in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, Iran (Islamic Republic of), the Libyan Arab Jamahiriya, Jordan, Kuwait, Morocco, Mauritania, Oman, Qatar, the Syrian Arab Republic, Sudan, Tunisia and Yemen, the bands 7350-7400 kHz and 7400-7450 kHz are also allocated to the fixed service on a primary basis.

5.143D In Region 2, the band 7350-7400 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.143E Until 29 March 2009, the band 7450-8100 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis.

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5.146 The bands 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 15600-15800 kHz, 17480-17550 kHz and 18900-19020 kHz are allocated to the fixed service on a primary basis until 1 April 2007, subject to application of the procedure referred to in Resolution 21 (Rev.WRC-95)[3]. After 1 April 2007, frequencies in these bands may be used by stations in the fixed service, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies in the fixed service, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

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5.151 The bands 13570-13600 kHz and 13800-13870 kHz are allocated, until 1 April 2007, to the fixed service on a primary basis and to the mobile except aeronautical mobile (R) service on a secondary basis, subject to application of the procedure referred to in Resolution 21 (Rev.WRC-95)[3]. After 1 April 2007, frequencies in these bands may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition that harmful interference is not caused to the broadcasting service. When using frequencies in these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.152 Additional allocation: in Armenia, Azerbaijan, China, Côte d'Ivoire, the Russian Federation, Georgia, Iran (Islamic Republic of), Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 14250-14350 kHz is also allocated to the fixed service on a primary basis. Stations of the fixed service shall not use a radiated power exceeding 24 dBW.

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[3] Note by the Secretariat: This Resolution was revised by WRC-03.

5.154 Additional allocation: in Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 18068-18168 kHz is also allocated to the fixed service on a primary basis for use within their boundaries, with a peak envelope power not exceeding 1 kW.

5.155 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Kazakhstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., Tajikistan, Turkmenistan and Ukraine, the band 21850-21870 kHz is also allocated to the aeronautical mobile (R) services on a primary basis.

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5.163 Additional allocation: in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., Tajikistan, Turkmenistan and Ukraine, the bands 47-48.5 MHz and 56.5-58 MHz are also allocated to the fixed and land mobile services on a secondary basis.

5.164 Additional allocation: in Albania, Germany, Austria, Belgium, Bosnia and Herzegovina, Botswana, Bulgaria, Côte d'Ivoire, Denmark, Spain, Estonia, Finland, France, Gabon, Greece, Ireland, Israel, Italy, the Libyan Arab Jamahiriya, Jordan, Lebanon, Liechtenstein, Luxembourg, Madagascar, Mali, Malta, Morocco, Mauritania, Monaco, Nigeria, Norway, the Netherlands, Poland, Syrian Arab Republic, the United Kingdom, Serbia and Montenegro, Slovenia, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia and Turkey, the band 47-68 MHz, in Romania the band 47-58 MHz, in South Africa the band 47-50 MHz, and in the Czech Rep. the band 66-68 MHz, are also allocated to the land mobile service on a primary basis. However, stations of the land mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations of countries other than those mentioned in connection with the band.

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5.174 Alternative allocation: in Bulgaria, Hungary and Romania, the band 68-73 MHz is allocated to the broadcasting service on a primary basis and used in accordance with the decisions in the Final Acts of the Special Regional Conference (Geneva, 1960).

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5.177 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Kazakhstan, Latvia, Moldova, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 73-74 MHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. 9.21.

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5.179 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, China, the Russian Federation, Georgia, Kazakhstan, Lithuania, Moldova, Mongolia, Kyrgyzstan, Slovakia, Tajikistan, Turkmenistan and Ukraine, the bands 74.6-74.8 MHz and 75.2-75.4 MHz are also allocated to the aeronautical radionavigation service, on a primary basis, for ground-based transmitters only.

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5.181 Additional allocation: in Egypt, Israel and the Syrian Arab Republic, the band 74.8-75.2 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. 9.21. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. 9.21.

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5.203B Additional allocation: in Saudi Arabia, United Arab Emirates, Oman and Syrian Arab Republic, the band 136-137 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis until 1 January 2005.

5.204 Different category of service: in Afghanistan, Saudi Arabia, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, China, Cuba, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Malaysia, Oman, Pakistan, the Philippines, Qatar, Serbia and Montenegro, Singapore, Thailand and Yemen, the band 137-138 MHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (see No. 5.33).

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5.210 Additional allocation: in France, Italy, the Czech Rep. and the United Kingdom, the bands 138-143.6 MHz and 143.65-144 MHz are also allocated to the space research service (space-to-Earth) on a secondary basis.

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5.212 Alternative allocation: in Angola, Botswana, Burundi, Cameroon, the Central African Rep., Congo (Rep. of the), Gabon, Gambia, Ghana, Guinea, Iraq, Libyan Arab Jamahiriya, Jordan, Lesotho, Liberia, Malawi, Mozambique, Namibia, Oman, Uganda, the Dem. Rep. of the Congo, Rwanda, Sierra Leone, South Africa, Swaziland, Chad, Togo, Zambia and Zimbabwe, the band 138-144 MHz is allocated to the fixed and mobile services on a primary basis.

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5.221 Stations of the mobile-satellite service in the band 148-149.9 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations in the following countries: Albania, Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bosnia and Herzegovina, Botswana, Brunei Darussalam, Bulgaria, Cameroon, China, Cyprus, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Croatia, Cuba, Denmark, Egypt, the United Arab Emirates, Eritrea, Spain, Estonia, Ethiopia, the Russian Federation, Finland, France, Gabon, Ghana, Greece, Guinea, Guinea Bissau, Hungary, India, Iran (Islamic Republic of), Ireland, Iceland, Israel, Italy, the Libyan Arab Jamahiriya, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mali, Malta, Mauritania, Moldova, Mongolia, Mozambique, Namibia, Norway, New Zealand, Oman, Uganda, Uzbekistan, Pakistan, Panama, Papua New Guinea, Paraguay, the Netherlands, the Philippines, Poland, Portugal, Qatar, the Syrian Arab Republic, Kyrgyzstan, Slovakia, Romania, the United Kingdom, Senegal, Serbia and Montenegro, Sierra Leone, Singapore, Slovenia, Sri Lanka, South Africa, Sweden, Switzerland, Swaziland, Tanzania, Chad, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Zambia, and Zimbabwe.

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5.237 Additional allocation: in Congo (Rep. of the), Eritrea, Ethiopia, Gambia, Guinea, the Libyan Arab Jamahiriya, Malawi, Mali, Sierra Leone, Somali, Chad and Zimbabwe, the band 174-223 MHz is also allocated to the fixed and mobile services on a secondary basis.

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5.254 The bands 235-322 MHz and 335.4-399.9 MHz may be used by the mobile-satellite service, subject to agreement obtained under No. 9.21, on condition that stations in this service do not cause harmful interference to those of other services operating or planned to be operated in accordance with the Table of Frequency Allocations except for the additional allocation made in footnote No. 5.256A.

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5.256A Additional allocation: in China, the Russian Federation, Kazakhstan and Ukraine, the band 258-261 MHz is also allocated to the space research service (Earth-to-space) and space operation service (Earth-to-space) on a primary basis. Stations in the space research service (Earth-to-space) and space operation service (Earth-to-space) shall not cause harmful interference to, nor claim protection from, nor constrain the use and development of the mobile service systems and mobile-satellite service systems operating in the band. Stations in space research service (Earth-to-space) and space operation service (Earth-to-space) shall not constrain the future development of fixed service systems of other countries.

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5.262 Additional allocation: in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Botswana, Bulgaria, Colombia, Costa Rica, Cuba, Egypt, the United Arab Emirates, Ecuador, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Liberia, Malaysia, Moldova, Uzbekistan, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Kyrgyzstan, Romania, Serbia and Montenegro, Singapore, Somalia, Tajikistan, Turkmenistan and Ukraine, the band 400.05-401 MHz is also allocated to the fixed and mobile services on a primary basis.

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5.271 Additional allocation: in Azerbaijan, Belarus, China, India, Latvia, Lithuania, Kyrgyzstan and Turkmenistan, the band 420-460 MHz is also allocated to the aeronautical radionavigation service (radio altimeters) on a secondary basis.

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5.273 Different category of service: in the Libyan Arab Jamahiriya, the allocation of the bands 430-432 MHz and 438-440 MHz to the radiolocation service is on a secondary basis (see No. 5.32).

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5.277 Additional allocation: in Angola, Armenia, Azerbaijan, Belarus, Cameroon, Congo (Rep. of the), Djibouti, the Russian Federation, Georgia, Hungary, Israel, Kazakhstan, Mali, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Rwanda, Tajikistan, Chad, Turkmenistan and Ukraine, the band 430-440 MHz is also allocated to the fixed service on a primary basis.

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5.279A The use of this band by sensors in the Earth exploration-satellite service (active) shall be in accordance with Recommendation ITU-R SA.1260-1. Additionally, the Earth exploration-satellite service (active) in the band 432-438 MHz shall not cause harmful interference to the aeronautical radionavigation service in China.

The provisions of this footnote in no way diminish the obligation of the Earth exploration-satellite service (active) to operate as a secondary service in accordance with Nos. 5.29 and 5.30.

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5.287 In the maritime mobile service, the frequencies 457.525 MHz, 457.550 MHz, 457.575 MHz, 467.525 MHz, 467.550 MHz and 467.575 MHz may be used by on-board communication stations. Where needed, equipment designed for 12.5 kHz channel spacing using also the additional frequencies 457.5375 MHz, 457.5625 MHz, 467.5375 MHz and 467.5625 MHz may be introduced for on-board communications. The use of these frequencies in territorial waters may be subject to the national regulations of the administration concerned. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174 (see Resolution 341 (WRC-97)[7]).

[7] Note by the Secretariat: This Resolution was abrogated by WRC-03.

5.288 In the territorial waters of the United States and the Philippines, the preferred frequencies for use by on-board communication stations shall be 457.525 MHz, 457.550 MHz, 457.575 MHz and 457.600 MHz paired, respectively, with 467.750 MHz, 467.775 MHz, 467.800 MHz and 467.825 MHz. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174-1.

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5.294 Additional allocation: in Burundi, Cameroon, Congo (Rep. of the), Côte d'Ivoire, Ethiopia, Israel, the Libyan Arab Jamahiriya, Kenya, Lebanon, Malawi, the Syrian Arab Republic, Sudan, Chad and Yemen, the band 470-582 MHz is also allocated to the fixed service on a secondary basis.

5.296 Additional allocation: in Germany, Austria, Belgium, Côte d'Ivoire, Denmark, Spain, Finland, France, Ireland, Israel, Italy, the Libyan Arab Jamahiriya, Lithuania, Malta, Morocco, Monaco, Norway, the Netherlands, Portugal, the Syrian Arab Republic, the United Kingdom, Sweden, Switzerland, Swaziland and Tunisia, the band 470-790 MHz is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting. Stations of the land mobile service in the countries listed in this footnote shall not cause harmful interference to existing or planned stations operating in accordance with the Table in countries other than those listed in this footnote.

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5.311 Within the frequency band 620-790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service subject to agreement between the administrations concerned and those having services, operating in accordance with the Table, which may be affected (see Resolutions 33 (Rev.WRC-03) and 507 (Rev.WRC-03)). Such stations shall not produce a power flux-density in excess of the value –129 dB(W/m^2) for angles of arrival less than 20° (see Recommendation 705) within the territories of other countries without the consent of the administrations of those countries. Resolution 545 (WRC-03) applies.

5.312 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Hungary, Kazakhstan, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 645-862 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

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5.316 Additional allocation: in Germany, Saudi Arabia, Bosnia and Herzegovina, Burkina Faso, Cameroon, Côte d'Ivoire, Croatia, Denmark, Egypt, Finland, Greece, Israel, the Libyan Arab Jamahiriya, Jordan, Kenya, The Former Yugoslav Republic of Macedonia, Liechtenstein, Mali, Monaco, Norway, the Netherlands, Portugal, the United Kingdom, the Syrian Arab Republic, Serbia and Montenegro, Sweden and Switzerland, the band 790-830 MHz, and in these same countries and in Spain, France, Gabon and Malta, the band 830-862 MHz, are also allocated to the mobile, except aeronautical mobile, service on a primary basis. However, stations of the mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, stations of services operating in accordance with the Table in countries other than those mentioned in connection with the band.

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5.323 Additional allocation: in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Hungary, Kazakhstan, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 862-960 MHz is also allocated to the aeronautical radionavigation service on a primary basis. Such use is subject to agreement obtained under No. 9.21 with administrations concerned and limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime.

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5.328A Stations in the radionavigation-satellite service in the band 1164-1215 MHz shall operate in accordance with the provisions of Resolution 609 (WRC-03) and shall not claim protection from stations in the aeronautical radionavigation service in the band 960-1215 MHz. No. 5.43A does not apply. The provisions of No. 21.18 shall apply.

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5.329 Use of the radionavigation-satellite service in the band 1215-1300 MHz shall be subject to the condition that no harmful interference is caused to, and no protection is claimed from, the radionavigation service authorized under No. 5.331. Furthermore, the use of the radionavigation-satellite service in the band 1215-1300 MHz shall be subject to the condition that no harmful interference is caused to the radiolocation service. No. 5.43 shall not apply in respect of the radiolocation service. Resolution 608 (WRC-03) shall apply.

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5.330 Additional allocation: in Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, China, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Japan, Jordan, Kuwait, Lebanon, Mozambique, Nepal, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Somalia, Sudan, Chad, Togo and Yemen, the band 1215-1300 MHz is also allocated to the fixed and mobile services on a primary basis.

5.331 Additional allocation: in Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brazil, Burkina Faso, Burundi, Cameroon, China, Korea (Rep. of), Croatia, Denmark, Egypt, the United Arab Emirates, Estonia, the Russian Federation, Finland, France, Ghana, Greece, Guinea, Equatorial Guinea, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Ireland, Israel, Jordan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Mauritania, Nigeria, Norway, Oman, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Slovakia, the United Kingdom, Serbia and Montenegro, Slovenia, Somalia, Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Thailand, Togo, Turkey, Venezuela and Viet Nam, the band 1215-1300 MHz is also allocated to the radionavigation service on a primary basis. In Canada and the United States, the band 1240-1300 MHz is also allocated to the radionavigation service, and use of the radionavigation service shall be limited to the aeronautical radionavigation service.

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5.334 Additional allocation: in Canada and the United States, the band 1350-1370 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

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5.338 In Azerbaijan, Mongolia, Kyrgyzstan, Slovakia, the Czech Rep., Romania and Turkmenistan, existing installations of the radionavigation service may continue to operate in the band 1350-1400 MHz.

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5.339A Additional allocation: the band 1390-1392 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a secondary basis and the band 1430-1432 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a secondary basis. These allocations are limited to use for feeder links for non-geostationary-satellite networks in the mobile-satellite service with service links below 1 GHz, and Resolution 745 (WRC-03) applies.

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5.345 Use of the band 1452-1492 MHz by the broadcasting-satellite service, and by the broadcasting service, is limited to digital audio broadcasting and is subject to the provisions of Resolution 528 (WARC-92)[3].

5.347 Different category of service: in Bangladesh, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Cuba, Denmark, Egypt, Greece, Ireland, Italy, Mozambique, Portugal, Serbia and Montenegro, Sri Lanka, Swaziland, Yemen and Zimbabwe, the allocation of the band 1452-1492 MHz to the broadcasting-satellite service and the broadcasting service is on a secondary basis until 1 April 2007.

5.347A In the bands:

1452-1492 MHz,
1525-1559 MHz,
1613.8-1626.5 MHz,
2655-2670 MHz,
2670-2690 MHz,
21.4-22 GHz,

Resolution 739 (WRC-03) applies.

5.348 The use of the band 1518-1525 MHz by the mobile-satellite service is subject to coordination under No. 9.11A. In the band 1518-1525 MHz stations in the mobile-satellite service shall not claim protection from the stations in the fixed service. No. 5.43A does not apply.

5.348A In the band 1518-1525 MHz, the coordination threshold in terms of the power flux-density levels at the surface of the Earth in application of No. 9.11A for space stations in the mobile-satellite (space-to-Earth) service, with respect to the land mobile service use for specialized mobile radios or used in conjunction with public switched telecommunication networks (PSTN) operating within the territory of Japan, shall be –150 dB(W/m²) in any 4 kHz band for all angles of arrival, instead of those given in Table 5-2 of Appendix 5. In the band 1518-1525 MHz stations in the mobile-satellite service shall not claim protection from stations in the mobile service in the territory of Japan. No. 5.43A does not apply.

5.348B In the band 1518-1525 MHz, stations in the mobile-satellite service shall not claim protection from aeronautical mobile telemetry stations in the mobile service in the territory of the United States (see Nos. 5.343 and 5.344) and in the countries listed in No. 5.342. No. 5.43A does not apply.

5.348C For the use of the bands 1518-1525 MHz and 1668-1675 MHz by the mobile-satellite service, see Resolution 225 (Rev.WRC-03).

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5.351A For the use of the bands 1525-1544 MHz, 1545-1559 MHz, 1610-1626.5 MHz, 1626.5-1645.5 MHz, 1646.5-1660.5 MHz, 1980-2010 MHz, 2170-2200 MHz, 2483.5-2500 MHz, 2500-2520 MHz and 2670-2690 MHz by the mobile-satellite service, see Resolutions 212 (Rev.WRC-97) and 225 (WRC-2000)[3].

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5.355 Additional allocation: in Bahrain, Bangladesh, Congo (Rep. of the), Egypt, Eritrea, Iraq, Israel, Kuwait, Lebanon, Malta, Qatar, Syrian Arab Republic, Somalia, Sudan, Chad, Togo and Yemen, the bands 1540-1559 MHz, 1610-1645.5 MHz and 1646.5-1660 MHz are also allocated to the fixed service on a secondary basis.

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5.359 Additional allocation: in Germany, Saudi Arabia, Armenia, Austria, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Cameroon, Spain, the Russian Federation, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, the Libyan Arab Jamahiriya, Jordan, Kazakhstan,

[3] Note by the Secretariat: This Resolution was revised by WRC-03.

Kuwait, Lebanon, Lithuania, Mauritania, Moldova, Mongolia, Uganda, Uzbekistan, Pakistan, Poland, the Syrian Arab Republic, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Swaziland, Tajikistan, Tanzania, Tunisia, Turkmenistan and Ukraine, the bands 1550-1559 MHz, 1610-1645.5 MHz and 1646.5-1660 MHz are also allocated to the fixed service on a primary basis. Administrations are urged to make all practicable efforts to avoid the implementation of new fixed-service stations in these bands.

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5.362B Additional allocation: The band 1559-1610 MHz is also allocated to the fixed service on a primary basis until 1 January 2005 in Germany, Armenia, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Spain, the Russian Federation, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, Kazakhstan, Lithuania, Moldova, Mongolia, Nigeria, Uganda, Uzbekistan, Pakistan, Poland, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Senegal, Swaziland, Tajikistan, Tanzania, Turkmenistan and Ukraine, and until 1 January 2010 in Saudi Arabia, Cameroon, the Libyan Arab Jamahiriya, Jordan, Kuwait, Lebanon, Mali, Mauritania, the Syrian Arab Republic and Tunisia. After these dates, the fixed service may continue to operate on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and the aeronautical radionavigation service and not authorize new frequency assignments to fixed-service systems in this band.

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5.369 Different category of service: in Angola, Australia, Burundi, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Israel, the Libyan Arab Jamahiriya, Lebanon, Liberia, Madagascar, Mali, Pakistan, Papua New Guinea, Syrian Arab Republic, the Dem. Rep. of the Congo, Sudan, Swaziland, Togo and Zambia, the allocation of the band 1610-1626.5 MHz to the radiodetermination-satellite service (Earth-to-space) is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21 from countries not listed in this provision.

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5.379B The use of the band 1668-1675 MHz by the mobile-satellite service is subject to coordination under No. 9.11A.

5.379C In order to protect the radio astronomy service in the band 1668-1670 MHz, the aggregate power flux-density values produced by mobile earth stations in a network of the mobile-satellite service operating in this band shall not exceed –181 dB(W/m²) in 10 MHz and –194 dB(W/m²) in any 20 kHz at any radio astronomy station recorded in the Master International Frequency Register, for more than 2% of integration periods of 2000 s.

5.379D For sharing of the band 1668-1675 MHz between the mobile-satellite service and the fixed, mobile and space research (passive) services, Resolution 744 (WRC-03) shall apply.

5.379E In the band 1668.4-1675 MHz, stations in the mobile-satellite service shall not cause harmful interference to stations in the meteorological aids service in China, Iran (Islamic Republic of), Japan and Uzbekistan. In the band 1668.4-1675 MHz, administrations are urged not to implement new systems in the meteorological aids service and are encouraged to migrate existing meteorological aids service operations to other bands as soon as practicable.

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5.380A In the band 1670-1675 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, existing earth stations in the meteorological-satellite service notified in accordance with Resolution 670 (WRC-03).

5.381 Additional allocation: in Afghanistan, Costa Rica, Cuba, India, Iran (Islamic Republic of) and Pakistan, the band 1690-1700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.382 Different category of service: in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Bulgaria, Congo (Rep. of the), Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Russian Federation, Guinea, Hungary, Iraq, Israel, Jordan, Kazakhstan, Kuwait, the Former Yugoslav Republic of Macedonia, Lebanon, Mauritania, Moldova, Mongolia, Oman, Uzbekistan, Poland, Qatar, the Syrian Arab Republic, Kyrgyzstan, Romania, Serbia and Montenegro, Somalia, Tajikistan, Tanzania, Turkmenistan, Ukraine and Yemen, the allocation of the band 1690-1700 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. 5.33), and in the Dem. People's Rep. of Korea, the allocation of the band 1690-1700 MHz to the fixed service is on a primary basis (see No. 5.33) and to the mobile, except aeronautical mobile, service on a secondary basis.

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5.386 Additional allocation: the band 1750-1850 MHz is also allocated to the space operation (Earth-to-space) and space research (Earth-to-space) services in Region 2, in Australia, Guam, India, Indonesia and Japan on a primary basis, subject to agreement obtained under No. 9.21, having particular regard to troposcatter systems.

5.387 Additional allocation: in Azerbaijan, Belarus, Georgia, Kazakhstan, Mongolia, Kyrgyzstan, Slovakia, Romania, Tajikistan and Turkmenistan, the band 1770-1790 MHz is also allocated to the meteorological-satellite service on a primary basis, subject to agreement obtained under No. 9.21.

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5.388A In Regions 1 and 3, the bands 1885-1980 MHz, 2010-2025 MHz and 2110-2170 MHz and, in Region 2, the bands 1885-1980 MHz and 2110-2160 MHz may be used by high altitude platform stations as base stations to provide International Mobile Telecommunications-2000 (IMT-2000), in accordance with Resolution 221 (Rev.WRC-03). Their use by IMT-2000 applications using high altitude platform stations as base stations does not preclude the use of these bands by any station in the services to which they are allocated and does not establish priority in the Radio Regulations.

5.388B In Algeria, Saudi Arabia, Bahrain, Benin, Burkina Faso, Cameroon, Comoros, Côte d'Ivoire, China, Cuba, Djibouti, Egypt, United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, India, Iran (Islamic Republic of), Israel, the Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Mali, Morocco, Mauritania, Nigeria, Oman, Uganda, Qatar, the Syrian Arab Republic, Senegal, Singapore, Sudan, Tanzania, Chad, Togo, Tunisia, Yemen, Zambia and Zimbabwe, for the purpose of protecting fixed and mobile services, including IMT-2000 mobile stations, in their territories from co-channel interference, a high altitude platform station (HAPS) operating as an IMT-2000 base station in neighbouring countries, in the bands referred to in No. 5.388A, shall not exceed a co-channel power flux-density of −127 dB(W/(m² · MHz)) at the Earth's surface outside a country's borders unless explicit agreement of the affected administration is provided at the time of the notification of HAPS.

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5.395 In France and Turkey, the use of the band 2310-2360 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service.

5.396 Space stations of the broadcasting-satellite service in the band 2310-2360 MHz operating in accordance with No. 5.393 that may affect the services to which this band is allocated in other countries shall be coordinated and notified in accordance with Resolution 33 (Rev.WRC-97)[3]. Complementary terrestrial broadcasting stations shall be subject to bilateral coordination with neighbouring countries prior to their bringing into use.

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[3] Note by the Secretariat: This Resolution was revised by WRC-03.

5.400 Different category of service: in Angola, Australia, Bangladesh, Burundi, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), the Libyan Arab Jamahiriya, Lebanon, Liberia, Madagascar, Mali, Pakistan, Papua New Guinea, the Dem. Rep. of the Congo, the Syrian Arab Republic, Sudan, Swaziland, Togo and Zambia, the allocation of the band 2483.5-2500 MHz to the radiodetermination-satellite service (space-to-Earth) is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21 from countries not listed in this provision.

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5.416 The use of the band 2520-2670 MHz by the broadcasting-satellite service is limited to national and regional systems for community reception, subject to agreement obtained under No. 9.21.

5.417A In applying provision No. 5.418, in Korea (Rep. of) and Japan, resolves 3 of Resolution 528 (Rev.WRC-03) is relaxed to allow the broadcasting-satellite service (sound) and the complementary terrestrial broadcasting service to additionally operate on a primary basis in the band 2605-2630 MHz. This use is limited to systems intended for national coverage. An administration listed in this provision shall not have simultaneously two overlapping frequency assignments, one under this provision and the other under No. 5.416. The provisions of No. 5.416 and Table 21-4 of Article 21 do not apply. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) in the band 2605-2630 MHz is subject to the provisions of Resolution 539 (Rev.WRC-03). The power flux-density at the Earth's surface produced by emissions from a geostationary broadcasting-satellite service (sound) space station operating in the band 2605-2630 MHz for which complete Appendix 4 coordination information, or notification information, has been received after 4 July 2003, for all conditions and for all methods of modulation, shall not exceed the following limits:

-130 dB(W/(m² · MHz))	for $0° \le \theta \le 5°$
$-130 + 0.4\ (\theta - 5)$ dB(W/(m² · MHz))	for $5° < \theta \le 25°$
-122 dB(W/(m² · MHz))	for $25° < \theta \le 90°$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. These limits may be exceeded on the territory of any country whose administration has so agreed. In the case of the broadcasting-satellite service (sound) networks of Korea (Rep. of), as an exception to the limits above, the power flux-density value of –122 dB(W/(m² · MHz)) shall be used as a threshold for coordination under No. 9.11 in an area of 1000 km around the territory of the administration notifying the broadcasting-satellite service (sound) system, for angles of arrival greater than 35°.

5.417B In Korea (Rep. of) and Japan, use of the band 2605-2630 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. 5.417A, for which complete Appendix 4 coordination information, or notification information, has been received after 4 July 2003, is subject to the application of the provisions of No. 9.12A, in respect of geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, is considered to have been received after 4 July 2003, and No. 22.2 does not apply. No. 22.2 shall continue to apply with respect to geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, is considered to have been received before 5 July 2003.

5.417C Use of the band 2605-2630 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. 5.417A, for which complete Appendix 4 coordination information, or notification information, has been received after 4 July 2003, is subject to the application of the provisions of No. 9.12.

5.417D Use of the band 2605-2630 MHz by geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, has been received after 4 July 2003 is subject to the application of the provisions of No. 9.13 with respect to non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. 5.417A, and No. 22.2 does not apply.

5.418 Additional allocation: in Korea (Rep. of), India, Japan, Pakistan and Thailand, the band 2535-2655 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is

subject to the provisions of Resolution 528 (Rev.WRC-03). The provisions of No. 5.416 and Table 21-4 of Article 21, do not apply to this additional allocation. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) is subject to Resolution 539 (Rev.WRC-03). Geostationary broadcasting-satellite service (sound) systems for which complete Appendix 4 coordination information has been received after 1 June 2005 are limited to systems intended for national coverage. The power flux-density at the Earth's surface produced by emissions from a geostationary broadcasting-satellite service (sound) space station operating in the band 2630-2655 MHz, and for which complete Appendix 4 coordination information has been received after 1 June 2005, shall not exceed the following limits, for all conditions and for all methods of modulation:

-130 dB(W/(m² · MHz))	for $0° \le \theta \le 5°$
$-130 + 0.4\ (\theta - 5)$ dB(W/(m² · MHz))	for $5° < \theta \le 25°$
-122 dB(W/(m² · MHz))	for $25° < \theta \le 90°$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. These limits may be exceeded on the territory of any country whose administration has so agreed. As an exception to the limits above, the pfd value of –122 dB(W/(m² · MHz)) shall be used as a threshold for coordination under No. 9.11 in an area of 1500 km around the territory of the administration notifying the broadcasting-satellite service (sound) system. In addition, the power flux-density value shall not exceed -100 dB(W/(m^2 · MHz)) anywhere on the territory of the Russian Federation.

In addition, an administration listed in this provision shall not have simultaneously two overlapping frequency assignments, one under this provision and the other under No. 5.416 for systems for which complete Appendix 4 coordination information has been received after 1 June 2005.

5.418A In certain Region 3 countries listed in No. 5.418, use of the band 2630-2655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound) for which complete Appendix 4 coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. 9.12A, in respect of geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, is considered to have been received after 2 June 2000, and No. 22.2 does not apply. No. 22.2 shall continue to apply with respect to geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, is considered to have been received before 3 June 2000.

5.418B Use of the band 2630-2655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. 5.418, for which complete Appendix 4 coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. 9.12.

5.418C Use of the band 2630-2655 MHz by geostationary-satellite networks for which complete Appendix 4 coordination information, or notification information, has been received after 2 June 2000 is subject to the application of the provisions of No. 9.13 with respect to non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. 5.418 and No. 22.2 does not apply.

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5.422 Additional allocation: in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Brunei Darussalam, Congo (Rep. of the), Côte d'Ivoire, Cuba, Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Russian Federation, Gabon, Georgia, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Israel, Jordan, Lebanon, Mauritania, Moldova, Mongolia, Nigeria, Oman, Uzbekistan, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Kyrgyzstan, the Dem. Rep. of the Congo, Romania, Serbia and Montenegro, Somalia, Tajikistan, Tunisia, Turkmenistan, Ukraine and Yemen, the band 2690-2700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985.

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5.424A In the band 2900-3100 MHz, stations in the radiolocation service shall not cause harmful interference to, nor claim protection from, radar systems in the radionavigation service.

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5.428 Additional allocation: in Azerbaijan, Cuba, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 3100-3300 MHz is also allocated to the radionavigation service on a primary basis.

5.429 Additional allocation: in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, China, Congo (Rep. of the), Korea (Rep. of), the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Japan, Jordan, Kenya, Kuwait, Lebanon, Malaysia, Oman, Pakistan, Qatar, the Syrian Arab Republic, Dem. People's Rep. of Korea and Yemen, the band 3300-3400 MHz is also allocated to the fixed and mobile services on a primary basis. The countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service.

5.430 Additional allocation: in Azerbaijan, Cuba, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 3300-3400 MHz is also allocated to the radionavigation service on a primary basis.

5.431 Additional allocation: in Germany, Israel and the United Kingdom, the band 3400-3475 MHz is also allocated to the amateur service on a secondary basis.

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5.443B In order not to cause harmful interference to the microwave landing system operating above 5030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5030-5150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5010-5030 MHz shall not exceed –124.5 dB(W/m²) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4990-5000 MHz, radionavigation-satellite service systems operating in the band 5010-5030 MHz shall comply with the limits in the band 4990-5000 MHz defined in Resolution 741 (WRC-03).

5.444 The band 5030-5150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. The requirements of this system shall take precedence over other uses of this band. For the use of this band, No. 5.444A and Resolution 114 (Rev.WRC-03) apply.

5.444A Additional allocation: the band 5091-5150 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis. This allocation is limited to feeder links of non-geostationary mobile-satellite systems in the mobile-satellite service and is subject to coordination under No. 9.11A.

In the band 5091-5150 MHz, the following conditions also apply:

– prior to 1 January 2018, the use of the band 5091-5150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution 114 (Rev.WRC-03);

– prior to 1 January 2018, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the 5000-5091 MHz band, shall take precedence over other uses of this band;

– after 1 January 2012, no new assignments shall be made to earth stations providing feeder links of non-geostationary mobile-satellite systems;

– after 1 January 2018, the fixed-satellite service will become secondary to the aeronautical radionavigation service.

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5.447E Additional allocation: The band 5250-5350 MHz is also allocated to the fixed service on a primary basis in the following countries in Region 3: Australia, Korea (Rep. of), India, Indonesia, Iran (Islamic Republic of), Japan, Malaysia, Papua New Guinea, the Philippines, Sri Lanka, Thailand and Viet Nam. The use of this band by the fixed service is intended for the implementation of fixed wireless

access systems and shall comply with Recommendation ITU-R F.1613. In addition, the fixed service shall not claim protection from the radiodetermination, Earth exploration-satellite (active) and space research (active) services, but the provisions of No. 5.43A do not apply to the fixed service with respect to the Earth exploration-satellite (active) and space research (active) services. After implementation of fixed wireless access systems in the fixed service with protection for the existing radiodetermination systems, no more stringent constraints should be imposed on the fixed wireless access systems by future radiodetermination implementations.

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5.453 Additional allocation: in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Egypt, the United Arab Emirates, Gabon, Guinea, Equatorial Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Japan, Jordan, Kenya, Kuwait, Lebanon, Madagascar, Malaysia, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Sri Lanka, Swaziland, Tanzania, Chad, Thailand, Togo, Viet Nam and Yemen, the band 5650-5850 MHz is also allocated to the fixed and mobile services on a primary basis. In this case, the provisions of Resolution 229 (WRC-03) do not apply.

5.454 Different category of service: in Azerbaijan, the Russian Federation, Georgia, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 5670-5725 MHz to the space research service is on a primary basis (see No. 5.33).

5.455 Additional allocation: in Armenia, Azerbaijan, Belarus, Cuba, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 5670-5850 MHz is also allocated to the fixed service on a primary basis.

5.456 Additional allocation: in Cameroon, the band 5755-5850 MHz is also allocated to the fixed service on a primary basis.

5.457A In the bands 5925-6425 MHz and 14-14.5 GHz, earth stations located on board vessels may communicate with space stations of the fixed-satellite service. Such use shall be in accordance with Resolution 902 (WRC-03).

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5.460 The use of the band 7145-7190 MHz by the space research service (Earth-to-space) is restricted to deep space; no emissions to deep space shall be effected in the band 7190-7235 MHz. Geostationary satellites in the space research service operating in the band 7190-7235 MHz shall not claim protection from existing and future stations of the fixed and mobile services and No. 5.43A does not apply.

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5.466 Different category of service: in Israel, Singapore and Sri Lanka, the allocation of the band 8400-8500 MHz to the space research service is on a secondary basis (see No. 5.32).

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5.468 Additional allocation: in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burundi, Cameroon, China, Congo (Rep. of the), Costa Rica, Egypt, the United Arab Emirates, Gabon, Guyana, Indonesia, Iran (Islamic Republic of), Iraq, the Libyan Arab Jamahiriya, Jamaica, Jordan, Kenya, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, Qatar, Syrian Arab Republic, the Dem. People's Rep. of Korea, Senegal, Singapore, Somalia, Swaziland, Tanzania, Chad, Togo, Tunisia and Yemen, the band 8500-8750 MHz is also allocated to the fixed and mobile services on a primary basis.

5.469 Additional allocation: in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Lithuania, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 8500-8750 MHz is also allocated to the land mobile and radionavigation services on a primary basis.

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5.473 Additional allocation: in Armenia, Austria, Azerbaijan, Belarus, Bulgaria, Cuba, the Russian Federation, Georgia, Hungary, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the bands 8850-9000 MHz and 9200-9300 MHz are also allocated to the radionavigation service on a primary basis.

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5.477 Different category of service: in Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Japan, Jordan, Kuwait, Lebanon, Liberia, Malaysia, Nigeria, Oman, Pakistan, Qatar, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Trinidad and Tobago, and Yemen, the allocation of the band 9800-10000 MHz to the fixed service is on a primary basis (see No. 5.33).

5.478 Additional allocation: in Azerbaijan, Bulgaria, Mongolia, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 9800-10000 MHz is also allocated to the radionavigation service on a primary basis.

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5.481 Additional allocation: in Germany, Angola, Brazil, China, Costa Rica, Côte d'Ivoire, El Salvador, Ecuador, Spain, Guatemala, Hungary, Japan, Kenya, Morocco, Nigeria, Oman, Uzbekistan, Paraguay, Peru, the Dem. People's Rep. of Korea, Tanzania, Thailand and Uruguay, the band 10.45-10.5 GHz is also allocated to the fixed and mobile services on a primary basis.

5.482 In the band 10.6-10.68 GHz, stations of the fixed and mobile, except aeronautical mobile, services shall be limited to a maximum equivalent isotropically radiated power of 40 dBW and the power delivered to the antenna shall not exceed –3 dBW. These limits may be exceeded subject to agreement obtained under No. 9.21. However, in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Bangladesh, Belarus, China, the United Arab Emirates, Georgia, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Kazakhstan, Kuwait, Latvia, Lebanon, Moldova, Nigeria, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Tajikistan and Turkmenistan, the restrictions on the fixed and mobile, except aeronautical mobile, services are not applicable.

5.483 Additional allocation: in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, China, Colombia, Korea (Rep. of), Costa Rica, Egypt, the United Arab Emirates, Georgia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Lebanon, Mongolia, Uzbekistan, Qatar, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Serbia and Montenegro, Tajikistan, Turkmenistan and Yemen, the band 10.68-10.7 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985.

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5.494 Additional allocation: in Algeria, Angola, Saudi Arabia, Bahrain, Cameroon, the Central African Rep., Congo (Rep. of the), Côte d'Ivoire, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Iraq, Israel, the Libyan Arab Jamahiriya, Jordan, Kuwait, Lebanon, Madagascar, Mali, Morocco, Mongolia, Nigeria, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Somalia, Sudan, Chad, Togo and Yemen, the band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.495 Additional allocation: in Bosnia and Herzegovina, Croatia, France, Greece, Liechtenstein, Monaco, Uganda, Portugal, Romania, Serbia and Montenegro, Slovenia, Switzerland, Tanzania and Tunisia, the band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis.

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5.500 Additional allocation: in Algeria, Angola, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Madagascar, Malaysia, Mali, Malta, Morocco, Mauritania, Nigeria, Pakistan, Qatar, the Syrian Arab Republic, Singapore, Sudan, Chad and Tunisia, the band 13.4-14 GHz is also allocated to the fixed and mobile services on a primary basis.

5.501 Additional allocation: in Azerbaijan, Hungary, Japan, Mongolia, Kyrgyzstan, Romania, the United Kingdom and Turkmenistan, the band 13.4-14 GHz is also allocated to the radionavigation service on a primary basis.

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5.502 In the band 13.75-14 GHz, an earth station of a geostationary fixed-satellite service network shall have a minimum antenna diameter of 1.2 m and an earth station of a non-geostationary fixed-satellite service system shall have a minimum antenna diameter of 4.5 m. In addition, the e.i.r.p., averaged over one second, radiated by a station in the radiolocation or radionavigation services shall not exceed 59 dBW for elevation angles above 2º and 65 dBW at lower angles. Before an administration brings into use an earth station in a geostationary-satellite network in the fixed-satellite service in this band with an antenna size smaller than 4.5 m, it shall ensure that the power flux-density produced by this earth station does not exceed:

– –115 dB(W/(m² · 10 MHz)) for more than 1% of the time produced at 36 m above sea level at the low water mark, as officially recognized by the coastal State;

– –115 dB(W/(m² · 10 MHz)) for more than 1% of the time produced 3 m above ground at the border of the territory of an administration deploying or planning to deploy land mobile radars in this band, unless prior agreement has been obtained.

For earth stations within the fixed-satellite service having an antenna diameter greater than or equal to 4.5 m, the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW.

5.503 In the band 13.75-14 GHz, geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service; after that date, new geostationary space stations in the space research service will operate on a secondary basis. Until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band:

– in the band 13.77-13.78 GHz, the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall not exceed:

  i) $4.7D + 28$ dB(W/40 kHz), where D is the fixed-satellite service earth station antenna diameter (m) for antenna diameters equal to or greater than 1.2 m and less than 4.5 m;

  ii) $49.2 + 20 \log(D/4.5)$ dB(W/40 kHz), where D is the fixed-satellite service earth station antenna diameter (m) for antenna diameters equal to or greater than 4.5 m and less than 31.9 m;

  iii) 66.2 dB(W/40 kHz) for any fixed-satellite service earth station for antenna diameters (m) equal to or greater than 31.9 m;

  iv) 56.2 dB(W/4 kHz) for narrow-band (less than 40 kHz of necessary bandwidth) fixed-satellite service earth station emissions from any fixed-satellite service earth station having an antenna diameter of 4.5 m or greater;

– the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in the 6 MHz band from 13.772 to 13.778 GHz.

Automatic power control may be used to increase the e.i.r.p. density in these frequency ranges to compensate for rain attenuation, to the extent that the power flux-density at the fixed-satellite service space station does not exceed the value resulting from use by an earth station of an e.i.r.p. meeting the above limits in clear-sky conditions.

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5.504C In the band 14-14.25 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, Côte d'Ivoire, Egypt, Guinea, India, Iran (Islamic Republic of), Kuwait, Lesotho, Nigeria, Oman, the Syrian Arab Republic and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. 5.29.

5.505 Additional allocation: in Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Botswana, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lesotho, Lebanon, Malaysia, Mali, Morocco, Mauritania, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Swaziland, Tanzania, Chad and Yemen, the band 14-14.3 GHz is also allocated to the fixed service on a primary basis.

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5.506A In the band 14-14.5 GHz, ship earth stations with an e.i.r.p. greater than 21 dBW shall operate under the same conditions as earth stations located on board vessels, as provided in Resolution 902 (WRC-03). This footnote shall not apply to ship earth stations for which the complete Appendix 4 information has been received by the Bureau prior to 5 July 2003.

5.506B Earth stations located on board vessels communicating with space stations in the fixed-satellite service may operate in the frequency band 14-14.5 GHz without the need for prior agreement from Cyprus, Greece and Malta, within the minimum distance given in Resolution 902 (WRC-03) from these countries.

5.508 Additional allocation: in Germany, Bosnia and Herzegovina, France, Italy, Libyan Arab Jamahiriya, The Former Yugoslav Rep. of Macedonia, the United Kingdom, Serbia and Montenegro and Slovenia, the band 14.25-14.3 GHz is also allocated to the fixed service on a primary basis.

5.508A In the band 14.25-14.3 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, China, Côte d'Ivoire, Egypt, France, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Lesotho, Nigeria, Oman, the Syrian Arab Republic, the United Kingdom and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. 5.29.

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5.509A In the band 14.3-14.5 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, Cameroon, China, Côte d'Ivoire, Egypt, France, Gabon, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Lesotho, Morocco, Nigeria, Oman, the Syrian Arab Republic, the United Kingdom, Sri Lanka, Tunisia and Viet Nam by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of

this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. 5.29.

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5.512 Additional allocation: in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, Cameroon, Congo (Rep. of the), Costa Rica, Egypt, El Salvador, the United Arab Emirates, Eritrea, Finland, Guatemala, India, Indonesia, Iran (Islamic Republic of), the Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Malaysia, Mali, Morocco, Mauritania, Mozambique, Nepal, Nicaragua, Oman, Pakistan, Qatar, Serbia and Montenegro, Singapore, Slovenia, Somalia, Sudan, Swaziland, Tanzania, Chad, Togo and Yemen, the band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis.

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5.514 Additional allocation: in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, Cameroon, Costa Rica, El Salvador, the United Arab Emirates, Finland, Guatemala, India, Iran (Islamic Republic of), Iraq, Israel, Italy, the Libyan Arab Jamahiriya, Japan, Jordan, Kuwait, Lithuania, Nepal, Nicaragua, Nigeria, Oman, Uzbekistan, Pakistan, Qatar, Kyrgyzstan, Serbia and Montenegro, Slovenia and Sudan, the band 17.3-17.7 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits given in Nos. 21.3 and 21.5 shall apply.

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5.516A In the band 17.3-17.7 GHz, earth stations of the fixed-satellite service (space-to-Earth) in Region 1 shall not claim protection from the broadcasting-satellite service feeder-link earth stations operating under Appendix 30A, nor put any limitations or restrictions on the locations of the broadcasting-satellite service feeder-link earth stations anywhere within the service area of the feeder link.

5.516B The following bands are identified for use by high-density applications in the fixed-satellite service:

17.3-17.7 GHz	(space-to-Earth) in Region 1,
18.3-19.3 GHz	(space-to-Earth) in Region 2,
19.7-20.2 GHz	(space-to-Earth) in all Regions,
39.5-40 GHz	(space-to-Earth) in Region 1,
40-40.5 GHz	(space-to-Earth) in all Regions,
40.5-42 GHz	(space-to-Earth) in Region 2,
47.5-47.9 GHz	(space-to-Earth) in Region 1,
48.2-48.54 GHz	(space-to-Earth) in Region 1,
49.44-50.2 GHz	(space-to-Earth) in Region 1,
and	
27.5-27.82 GHz	(Earth-to-space) in Region 1,
28.35-28.45 GHz	(Earth-to-space) in Region 2,
28.45-28.94 GHz	(Earth-to-space) in all Regions,
28.94-29.1 GHz	(Earth-to-space) in Region 2 and 3,
29.25-29.46 GHz	(Earth-to-space) in Region 2,
29.46-30 GHz	(Earth-to-space) in all Regions,
48.2-50.2 GHz	(Earth-to-space) in Region 2.

This identification does not preclude the use of these bands by other fixed-satellite service applications or by other services to which these bands are allocated on a co-primary basis and does not establish priority in these Radio Regulations among users of the bands. Administrations should take this into account when considering regulatory provisions in relation to these bands. See Resolution 143 (WRC-03).

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5.521 Alternative allocation: in Germany, Denmark, the United Arab Emirates and Greece, the band 18.1-18.4 GHz is allocated to the fixed, fixed-satellite (space-to-Earth) and mobile services on a primary basis (see No. 5.33). The provisions of No. 5.519 also apply.

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5.530 In Regions 1 and 3, the allocation to the broadcasting-satellite service in the band 21.4-22 GHz shall come into effect on 1 April 2007. The use of this band by the broadcasting-satellite service after that date and on an interim basis prior to that date is subject to the provisions of Resolution 525 (WARC-92)[3].

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5.536A Administrations operating earth stations in the Earth exploration-satellite service or the space research service shall not claim protection from stations in the fixed and mobile services operated by other administrations. In addition, earth stations in the Earth exploration-satellite service or in the space research service should be operated taking into account Recommendations ITU-R SA.1278 and ITU-R SA.1625, respectively.

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5.536C In Algeria, Saudi Arabia, Bahrain, Botswana, Brazil, Cameroon, Comoros, Cuba, Djibouti, Egypt, United Arab Emirates, Estonia, Finland, Iran (Islamic Republic of), Israel, Jordan, Kenya, Kuwait, Lithuania, Malaysia, Morocco, Nigeria, Oman, Qatar, Syrian Arab Republic, Somalia, Sudan, Tanzania, Tunisia, Uruguay, Zambia and Zimbabwe, earth stations operating in the space research service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services.

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5.537A In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 27.5-28.35 GHz may also be used by high altitude platform stations (HAPS). The use of HAPS within the band 27.5-28.35 GHz is limited, within the territory of the countries listed above, to a single 300 MHz sub-band. Such use of 300 MHz of the fixed-service allocation by HAPS in the above countries is further limited to operation in the HAPS-to-ground direction and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems or other co-primary services. Furthermore, the development of these other services shall not be constrained by HAPS. See Resolution 145 (WRC-03).

5.538 Additional allocation: the bands 27.500-27.501 GHz and 29.999-30.000 GHz are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis for the beacon transmissions intended for up-link power control. Such space-to-Earth transmissions shall not exceed an equivalent isotropically radiated power (e.i.r.p.) of +10 dBW in the direction of adjacent satellites on the geostationary-satellite orbit. In the band 27.500-27.501 GHz, such space-to-Earth transmissions shall not produce a power flux-density in excess of the values specified in Article 21, Table 21-4 on the Earth's surface.

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5.543A In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 31-31.3 GHz may also be used by systems using high altitude platform stations (HAPS) in the ground-to-HAPS direction. The use of the band 31-31.3 GHz by systems using HAPS is limited to the territory of the countries listed above and shall not cause harmful

[3] Note by the Secretariat: This Resolution was revised by WRC-03.

interference to, nor claim protection from, other types of fixed-service systems, systems in the mobile service and systems operated under No. 5.545. Furthermore, the development of these services shall not be constrained by HAPS. Systems using HAPS in the band 31-31.3 GHz shall not cause harmful interference to the radio astronomy service having a primary allocation in the band 31.3-31.8 GHz, taking into account the protection criterion as given in Recommendation ITU-R RA.769. In order to ensure the protection of satellite passive services, the level of unwanted power density into a HAPS ground station antenna in the band 31.3-31.8 GHz shall be limited to −106 dB(W/MHz) under clear-sky conditions, and may be increased up to −100 dB(W/MHz) under rainy conditions to take account of rain attenuation, provided the effective impact on the passive satellite does not exceed the impact under clear-sky conditions as given above. See Resolution 145 (WRC-03).

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5.545 Different category of service: in Armenia, Azerbaijan, Georgia, Mongolia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 31-31.3 GHz to the space research service is on a primary basis (see No. 5.33).

5.546 Different category of service: in Saudi Arabia, Armenia, Azerbaijan, Belarus, Egypt, the United Arab Emirates, Spain, Estonia, the Russian Federation, Finland, Georgia, Hungary, Iran (Islamic Republic of), Israel, Jordan, Latvia, Lebanon, Moldova, Mongolia, Uzbekistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Romania, the United Kingdom, South Africa, Tajikistan, Turkmenistan and Turkey, the allocation of the band 31.5-31.8 GHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. 5.33).

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5.547C Alternative allocation: in the United States, the band 32-32.3 GHz is allocated to the radionavigation and space research (deep space) (space-to-Earth) services on a primary basis.

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5.548 In designing systems for the inter-satellite service in the band 32.3-33 GHz, for the radionavigation service in the band 32-33 GHz, and for the space research service (deep space) in the band 31.8-32.3 GHz, administrations shall take all necessary measures to prevent harmful interference between these services, bearing in mind the safety aspects of the radionavigation service (see Recommendation 707).

5.549 Additional allocation: in Saudi Arabia, Bahrain, Bangladesh, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Jordan, Kuwait, Lebanon, Malaysia, Mali, Malta, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Singapore, Somalia, Sudan, Sri Lanka, Togo, Tunisia and Yemen, the band 33.4-36 GHz is also allocated to the fixed and mobile services on a primary basis.

5.549A In the band 35.5-36.0 GHz, the mean power flux-density at the Earth's surface, generated by any spaceborne sensor in the Earth exploration-satellite service (active) or space research service (active), for any angle greater than 0.8º from the beam centre shall not exceed −73.3 dB(W/m^2) in this band.

5.550 Different category of service: in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 34.7-35.2 GHz to the space research service is on a primary basis (see No. 5.33).

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5.551I The power flux-density in the band 42.5-43.5 GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth), or the broadcasting-satellite service (space-to-Earth) operating in the 42-42.5 GHz band, shall not exceed the following values at the site of any radio astronomy station:

–137 dB(W/m^2) in 1 GHz and –153 dB(W/m^2) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a single-dish telescope; and

–116 dB(W/m^2) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a very long baseline interferometry station.

These values shall apply at the site of any radio astronomy station that either:

– was in operation prior to 5 July 2003 and has been notified to the Bureau before 4 January 2004; or

– was notified before the date of receipt of the complete Appendix 4 information for coordination or notification, as appropriate, for the space station to which the limits apply.

Other radio astronomy stations notified after these dates may seek an agreement with administrations that have authorized the space stations. In Region 2, Resolution 743 (WRC-03) shall apply. The limits in this footnote may be exceeded at the site of a radio astronomy station of any country whose administration so agreed.

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5.552A The allocation to the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz is designated for use by high altitude platform stations. The use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz is subject to the provisions of Resolution 122 (WRC-97)[3].

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5.555B The power flux-density in the band 48.94-49.04 GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth) operating in the bands 48.2-48.54 GHz and 49.44-50.2 GHz shall not exceed –151.8 dB(W/m^2) in any 500 kHz band at the site of any radio astronomy station.

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UNITED STATES (US) FOOTNOTES

(These footnotes, each consisting of the letters "US" followed by one or more digits, denote stipulations applicable to both Federal and non-Federal operations and thus appear in both the Federal Table and the non-Federal Table.)

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US18 In the bands 9-14 kHz, 90-110 kHz, 190-415 kHz, 510-535 kHz, and 2700-2900 MHz, navigation aids in the U.S. and its insular areas are normally operated by the Federal Government. However, authorizations may be made by the FCC for non-Federal operations in these bands subject to the conclusion of appropriate arrangements between the FCC and the Federal agencies concerned and upon special showing of need for service which the Federal Government is not yet prepared to render.

US25 The use of frequencies in the band 25.85-26.175 MHz may be authorized in any area to non-Federal remote pickup broadcast base and mobile stations on the condition that harmful interference is not caused to stations of the broadcasting service in the band 25.85-26.1 MHz and to stations of the maritime mobile service in the band 26.1-26.175 MHz. Frequencies within the band 26.1-26.175 MHz may also be assigned for use by low power auxiliary stations.

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US32 Except for the frequencies 123.3 and 123.5 MHz, which are not authorized for Federal use, the band 123.1125-123.5875 MHz is available for FAA communications incident to flight test and inspection activities pertinent to aircraft and facility certification on a secondary basis.

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[3] Note by the Secretariat: This Resolution was revised by WRC-03.

US41 In the band 2450-2500 MHz, the Federal radiolocation service is permitted on condition that harmful interference is not caused to non-Federal services.

US44 In the band 2900-3100 MHz, the non-Federal radiolocation service may be authorized on the condition that no harmful interference is caused to Federal services.

US48 In the band 9000-9200 MHz, the use of the radiolocation service by non-Federal licensees may be authorized on the condition that harmful interference is not caused to the aeronautical radionavigation service or to the Federal radiolocation service.

US49 In the band 5460-5470 MHz, the non-Federal radiolocation service may be authorized on the condition that it does not cause harmful interference to the aeronautical or maritime radionavigation services or to the Federal radiolocation service.

US50 In the band 5470-5650 MHz, the radiolocation service may be authorized for non-Federal use on the condition that harmful interference is not caused to the maritime radionavigation service or to the Federal radiolocation service.

US51 In the band 9300-9500 MHz, the radiolocation service may be authorized for non-Federal use on the condition that harmful interference is not caused to the Federal radiolocation service.

US53 In view of the fact that the band 13.25-13.4 GHz is allocated to doppler navigation aids, Federal and non-Federal airborne doppler radars in the aeronautical radionavigation service are permitted in the band 8750-8850 MHz only on the condition that they must accept any interference that may be experienced from stations in the radiolocation service in the band 8500-10000 MHz.

US58 In the band 10-10.5 GHz, pulsed emissions are prohibited, except for weather radars on board meteorological satellites in the band 10-10.025 GHz. The amateur service and the non-Federal radiolocation service, which shall not cause harmful interference to the Federal radiolocation service, are the only non-Federal services permitted in this band. The non-Federal radiolocation service is limited to survey operations as specified in footnote US108.

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US74 In the bands 25.55-25.67, 73.0-74.6, 406.1-410.0, 608-614, 1400-1427 (see US368), 1660.5-1670.0, 2690-2700, and 4990-5000 MHz, and in the bands 10.68-10.7, 15.35-15.4, 23.6-24.0, 31.3-31.5, 86-92, 100-102, 109.5-111.8, 114.25-116, 148.5-151.5, 164-167, 200-209, and 250-252 GHz, the radio astronomy service shall be protected from unwanted emissions only to the extent that such radiation exceeds the level which would be present if the offending station were operating in compliance with the technical standards or criteria applicable to the service in which it operates. Radio astronomy observations in these bands are performed at the locations listed in US311.

US77 Federal stations may also be authorized: (a) Port operations use on a simplex basis by coast and ship stations of the frequencies 156.6 and 156.7 MHz; (b) Duplex port operations use of the frequency 157.0 MHz for ship stations and 161.6 MHz for coast stations; (c) Inter-ship use of 156.3 MHz on a simplex basis; and (d) Vessel traffic services under the control of the U.S. Coast Guard on a simplex basis by coast and ship stations on the frequencies 156.25, 156.55, 156.6 and 156.7 MHz. (e) Navigational bridge-to-bridge and navigational communications on a simplex basis by coast and ship stations on the frequencies 156.375 and 156.65 MHz

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US80 Federal stations may use the frequency 122.9 MHz subject to the following conditions: (a) All operations by Federal stations shall be restricted to the purpose for which the frequency is authorized to non-Federal stations, and shall be in accordance with the appropriate provisions of the Commission's Rules and Regulations, Part 87, Aviation Services; (b) Use of the frequency is required for coordination of activities with Commission licensees operating on this frequency; and (c) Federal stations will not be authorized for operation at fixed locations.

US81 The band 38.0-38.25 MHz is used by both Federal and non-Federal radio astronomy observatories. No new fixed or mobile assignments are to be made and Federal stations in the band 38.0-38.25 MHz will be moved to other bands on a case-by-case basis, as required, to protect radio astronomy observations from harmful interference. As an exception, however, low powered military transportable and mobile stations used for tactical and training purposes will continue to use the band. To the extent practicable, the latter operations will be adjusted to relieve such interference as may be caused to radio astronomy observations. In the event of harmful interference from such local operations, radio astronomy observatories may contact local military commands directly, with a view to effecting relief. A list of military commands, areas of coordination, and points of contact for purposes of relieving interference may be obtained upon request from the Office of Engineering and Technology, Federal Communications Commission, Washington, D.C. 20554.

US82 In the bands 4146-4152 kHz, 6224-6233 kHz, 8294-8300 kHz, 12353-12368 kHz, 16528-16549 kHz, 18825-18846 kHz, 22159-22180 kHz, and 25100-25121 kHz, the assignable frequencies may be authorized on a shared non-priority basis to Federal and non-Federal ship and coast stations (SSB telephony, with peak envelope power not to exceed 1 kW).

US87 The band 449.75-450.25 MHz may be used by Federal and non-Federal stations for space telecommand (Earth-to-space) at specific locations, subject to such conditions as may be applied on a case-by-case basis. Operators shall take all practical steps to keep the carrier frequency close to 450 MHz.

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US104 In the band 90-110 kHz, the LORAN radionavigation system has priority in the United States and its insular areas. Radiolocation land stations making use of LORAN type equipment may be authorized to both Federal and non-Federal licensees on a secondary basis for offshore radiolocation activities only at specific locations and subject to such technical and operational conditions (e.g., power, emission, pulse rate and phase code, hours of operation), including on-the-air testing, as may be required on a case-by-case basis to ensure protection of the LORAN radionavigation system from harmful interference and to ensure mutual compatibility among radiolocation operators. Such authorizations to stations in the radiolocation service are further subject to showing of need for service which is not currently provided and which the Federal Government is not yet prepared to render by way of the radionavigation service.

US106 The frequency 156.75 MHz is available for assignment to Federal and non-Federal stations for environmental communications in accordance with an agreed plan.

US107 The frequency 156.8 MHz is the national distress, safety and calling frequency for the maritime mobile VHF radiotelephone service for use by Federal and non-Federal ship and coast stations. Guard bands of 156.7625-156.7875 and 156.8125-156.8375 MHz are maintained.

US108 In the bands 3300-3500 MHz and 10-10.5 GHz, survey operations, using transmitters with a peak power not to exceed five watts into the antenna, may be authorized for Federal and non-Federal use on a secondary basis to other Federal radiolocation operations.

US110 In the band 9200-9300 MHz, the use of the radiolocation service by non-Federal licensees may be authorized on the condition that harmful interference is not caused to the maritime radionavigation service or to the Federal radiolocation service.

US112 The frequency 123.1 MHz is for search and rescue communications. This frequency may be assigned for air traffic control communications at special aeronautical events on the condition that no harmful interference is caused to search and rescue communications during any period of search and rescue operations in the locale involved.

US116 In the bands 890-902 MHz and 935-941 MHz, no new assignments are to be made to Federal radio stations after July 10, 1970 except on case-by-case basis, to experimental stations and to additional stations of existing networks in Alaska. Federal assignments existing prior to July 10 1970 to stations in Alaska may be continued. All other existing Federal assignments shall be on a secondary basis to stations

in the non-Federal land mobile service and shall be subject to adjustment or removal from the bands 890-902 MHz, 928-932 MHz and 935-941 MHz at the request of the FCC.

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US209 The use of frequencies 460.6625, 460.6875, 460.7125, 460.7375, 460.7625, 460.7875, 460.8125, 460.8375, 460.8625, 465.6625, 465.6875, 465.7125, 465.7375, 465.7625, 465.7875, 465.8125, 465.8375, and 465.8625 MHz may be authorized, with 100 mW or less output power, to Federal and non-Federal radio stations for one-way, non-voice bio-medical telemetry operations in hospitals, or medical or convalescent centers.

US210 In the bands 40.66-40.7 MHz and 216-220 MHz, frequencies may be authorized to Federal and non-Federal stations on a secondary basis for the tracking of, and telemetering of scientific data from, ocean buoys and wildlife. Operation in these bands is subject to the technical standards specified in: (a) Section 8.2.42 of the NTIA Manual for Federal use, or (b) 47 CFR § 90.248 for non-Federal use. After January 1, 2002, no new assignments shall be authorized in the band 216-217 MHz.

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US217 In the band 420-450 MHz, pulse-ranging radiolocation systems may be authorized for Federal and non-Federal use along the shorelines of the contiguous 48 States and Alaska. In the sub-band 420-435 MHz, spread spectrum radiolocation systems may be authorized for Federal and non-Federal use within the contiguous 48 States and Alaska. All stations operating in accordance with this provision shall be secondary to stations operating in accordance with the Table of Frequency Allocations. Authorizations shall be granted on a case-by-case basis; however, operations proposed to be located within the following geographic areas should not expect to be accommodated:

(a) In Arizona, Florida (including the Key West area), and New Mexico.

(b) In those portions of California and Nevada that is south of latitude 37° 10' North.

(c) In that portion of Texas that is west of longitude 104° 00' West.

(d) Within 322 kilometers (200 miles) of: (1) Eglin AFB, FL (30° 30' N, 86° 30' W); (2) Patrick AFB, FL (28° 21' N, 80° 43' W); and (3) Pacific Missile Test Center, Point Mugu, CA (34° 09' N, 119° 11' W).

(e) Within 240 kilometers (150 miles) of Beale AFB, CA (39° 08' N, 121° 26' W).

(f) Within 200 kilometers (124 miles) of: (1) Goodfellow AFB, TX (31° 25' N, 100° 24' W); and (2) Warner Robins AFB, GA (32° 38' N, 83° 35' W).

(g) Within 160 kilometers (100 miles) of: (1) Clear, AK (64° 17' N, 149° 10' W); (2) Concrete, ND (48° 43' N, 97° 54' W); and (3) Otis AFB, MA (41° 45' N, 70° 32' W).

US218 The band 902–928 MHz is available for Location and Monitoring Service (LMS) systems subject to not causing harmful interference to the operation of all Federal stations authorized in this band. These systems must tolerate interference from the operation of industrial, scientific, and medical (ISM) equipment and the operation of Federal stations authorized in this band.

US220 The frequencies 36.25 and 41.71 MHz may be authorized to Federal stations and non-Federal stations in the petroleum radio service, for oil spill containment and cleanup operations. The use of these frequencies for oil spill containment or cleanup operations is limited to the inland and coastal waterway regions.

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US224 Federal systems utilizing spread spectrum techniques for terrestrial communication, navigation and identification may be authorized to operate in the band 960-1215 MHz on the condition that harmful interference will not be caused to the aeronautical radionavigation service. These systems will be handled on a case-by-case basis. Such systems shall be subject to a review at the national level for operational requirements and electromagnetic compatibility prior to development, procurement or modification.

US225 In addition to its present Federal use, the band 510-525 kHz is available to Federal and non-Federal aeronautical radionavigation stations inland of the Territorial Base Line as coordinated with

the military services. In addition, the frequency 510 kHz is available for non-Federal ship-helicopter operations when beyond 100 nautical miles from shore and required for aeronautical radionavigation.

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US229 Federal use of the fixed and land mobile services in the band 216-220 MHz and of the aeronautical mobile service in the band 217-220 MHz shall be limited to telemetering and associated telecommand operations. After January 1, 2002, no new Federal assignments shall be authorized in the band 216-217 MHz. The sub-band 216.88-217.08 MHz is allocated to the radiodetermination service on a primary basis for Federal use, limited to the Navy's Space Surveillance (SPASUR) radar system at the following nine sites (Coordinate datum: NAD83).

(a) Three stations transmit at a very high power and other operations may be affected within the following areas:

Transmitter sites	Coordinates	Frequency	Interference radius
Gila River (Phoenix), AZ…….	33° 06' 32" N, 112° 01' 45" W	216.97 MHz	150 km (93.2 miles)
Lake Kickapoo (Archer City), TX……..	33° 32' 47" N, 98° 45' 46" W	216.983 MHz	250 km (155.3 miles)
Jordan Lake (Wetumpka), AL…	32° 39' 33" N, 86° 15' 52" W	216.99 MHz	150 km

(b) Reception of the sub-band 216.965-216.995 MHz shall be protected from harmful interference within 50 kilometers (31.1 miles) of the following sites:

Receive sites	Coordinates
Elephant Butte, NM……..	33° 26' 35" N, 106° 59' 50" W
Fort Stewart, GA……...	31° 58' 36" N, 081° 30' 34" W
Hawkinsville, GA…….....	32° 17' 20" N, 083° 32' 10" W
Red River, AR……..	33° 19' 48" N, 093° 33' 01" W
San Diego, CA…..……	32° 34' 42" N, 116° 58' 11" W
Silver Lake, MS……	33° 08' 42" N, 091° 01' 16" W

US230 The bands 422.1875-425.4875 MHz and 427.1875-429.9875 MHz are allocated to the land mobile service on a primary basis for non-Federal use within 80.5 kilometers (50 miles) of Cleveland, OH (41° 29' 51.2" N, 81° 41' 49.5" W) and Detroit, MI (42° 19' 48.1" N, 83° 02' 56.7" W). The bands 423.8125-425.4875 MHz and 428.8125-429.9875 MHz are allocated to the land mobile service on a primary basis for non-Federal use within 80.5 kilometers of Buffalo, NY (42° 52' 52.2" N, 78° 52' 20.1" W). Coordinate datum: NAD83.

US231 When an assignment cannot be obtained in the bands between 200 kHz and 525 kHz, which are allocated to aeronautical radionavigation, assignments may be made to aeronautical radiobeacons in the maritime mobile band 435-490 kHz, on a secondary basis, subject to the coordination and agreement of those agencies having assignments within the maritime mobile band which may be affected. Assignments to Federal aeronautical radionavigation radiobeacons in the band 435-490 kHz shall not be a bar to any required changes to the maritime mobile radio service and shall be limited to non-voice emissions.

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US240 The bands 1715-1725 and 1740-1750 kHz are allocated on a primary basis and the bands 1705-1715 kHz and 1725-1740 kHz on a secondary basis to the aeronautical radionavigation service (radiobeacons).

US244 The band 136-137 MHz is allocated to the non-Federal aeronautical mobile (R) service on a primary basis, and is subject to pertinent international treaties and agreements. The frequencies 136, 136.025, 136.05, 136.075, 136.1, 136.125, 136.15, 136.175, 136.2, 136.225, 136.25, 136.275, 136.3, 136.325, 136.35, 136.375, 136.4, 136.425, 136.45, and 136.475 MHz are available on a shared basis to the Federal Aviation Administration for air traffic control purposes, such as automatic weather

observation stations (AWOS), automatic terminal information services (ATIS), flight information services-broadcast (FIS-B), and airport control tower communications.

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US252 The band 2110-2120 MHz is also allocated to the space research service (deep space) (Earth-to-space) on a primary basis at Goldstone, California.

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US258 In the bands 8025-8400 MHz and 25.5-27 GHz, the Earth exploration-satellite service (space-to-Earth) is allocated on a primary basis for non-Federal use. Authorizations are subject to a case-by-case electromagnetic compatibility analysis.

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US262 The band 7145-7190 MHz is also allocated to the space research service (deep space) (Earth-to-space) on a secondary basis for non-Federal use. The use of the bands 7145-7190 MHz and 34.2-34.7 GHz by the space research service (deep space) (Earth-to-space) and of the band 31.8-32.3 GHz by the space research service (deep space) (space-to-Earth) is limited to Goldstone, California.

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US266 Non-Federal licensees in the Public Safety Radio Pool holding a valid authorization on June 30, 1958, to operate in the frequency band 156.27-157.45 MHz or on the frequencies 161.85 MHz or 161.91 MHz may, upon proper application, continue to be authorized for such operation, including expansion of existing systems, until such time as harmful interference is caused to the operation of any authorized station other than those licensed in the Public Safety Radio Pool.

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US268 The bands 890-902 MHz and 928-942 MHz are also allocated to the radiolocation service for Federal ship stations (off-shore ocean areas) on the condition that harmful interference is not caused to non-Federal land mobile stations. The provisions of footnote US116 apply.

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US275 The band 902-928 MHz is allocated on a secondary basis to the amateur service subject to not causing harmful interference to the operations of Federal stations authorized in this band or to Location and Monitoring Service (LMS) systems. Stations in the amateur service must tolerate any interference from the operations of industrial, scientific, and medical (ISM) devices, LMS systems, and the operations of Federal stations authorized in this band. Further, the amateur service is prohibited in those portions of Texas and New Mexico bounded on the south by latitude 31° 41' North, on the east by longitude 104° 11' West, and on the north by latitude 34° 30' North, and on the west by longitude 107° 30' West; in addition, outside this area but within 150 miles of these boundaries of White Sands Missile Range the service is restricted to a maximum transmitter peak envelope power output of 50 watts.

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US281 In the band 25070-25210 kHz, non-Federal stations in the Industrial/Business Pool shall not cause harmful interference to, and must accept interference from, stations in the maritime mobile service operating in accordance with the Table of Frequency Allocations.

US282 In the band 4650-4700 kHz, frequencies may be authorized for non-Federal communication with helicopters in support of off-shore drilling operations on the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations.

US283 In the bands 2850-3025 kHz, 3400-3500 kHz, 4650-4700 kHz, 5450-5680 kHz, 6525-6685 kHz, 10005-10100 kHz, 11275-11400 kHz, 13260-13360 kHz, and 17900-17970 kHz, frequencies may be authorized for non-Federal flight test purposes on the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations.

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US296 In the bands designated for ship wide-band telegraphy, facsimile and special transmission systems, the following assignable frequencies are available to non-Federal stations on a shared basis with Federal stations: 2070.5 kHz, 2072.5 kHz, 2074.5 kHz, 2076.5 kHz, 4154 kHz, 4170 kHz, 6235 kHz, 6259 kHz, 8302 kHz, 8338 kHz, 12370 kHz, 12418 kHz, 16551 kHz, 16615 kHz, 18848 kHz, 18868 kHz, 22182 kHz, 22238 kHz, 25123 kHz, and 25159 kHz.

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US298 Channels 27555 kHz, 27615 kHz, 27635 kHz, 27655 kHz, 27765 kHz, and 27860 kHz are available for use by forest product licensees on a secondary basis to Federal operations including experimental stations. Non-Federal operations on these channels will not exceed 150 watts output power and are limited to the states of Washington, Oregon, Maine, North Carolina, South Carolina, Tennessee, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas (eastern portion).

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US300 The frequencies 169.445, 169.505, 170.245, 170.305, 171.045, 171.105, 171.845 and 171.905 MHz are available for wireless microphone operations on a secondary basis to Federal and non-Federal operations.

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US303 In the band 2285-2290 MHz, non-Federal space stations in the space research, space operations and Earth exploration-satellite services may be authorized to transmit to the Tracking and Data Relay Satellite System subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not cause harmful interference to authorized Federal stations. The power flux-density at the Earth's surface from such non-Federal stations shall not exceed -144 to -154 dBW/m^2/4 kHz, depending on angle of arrival, in accordance with ITU Radio Regulation 21.16.

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US310 In the band 14.896-15.121 GHz, non-Federal space stations in the space research service may be authorized on a secondary basis to transmit to Tracking and Data Relay Satellites subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not cause harmful interference to authorized Federal stations. The power flux-density produced by such non-Federal stations at the Earth's surface in any 1 MHz band for all conditions and methods of modulation shall not exceed:

-124 dB(W/m^2) for $0° < \theta \leq 5°$
$-124 + (\theta - 5)/2$ dB(W/m^2) for $5° < \theta \leq 25°$
-114 dB(W/m^2) for $25° < \theta \leq 90°$

where θ is the angle of arrival of the radio-frequency wave (degrees above the horizontal). These limits relate to the power flux-density and angles of arrival which would be obtained under free-space propagation conditions.

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US316 The band 2900-3000 MHz is also allocated on a primary basis to the meteorological aids service. Operations in this service are limited to Federal Next Generation Weather Radar (NEXRAD) systems where accommodation in the 2700-2900 MHz band is not technically practical and are subject to coordination with existing authorized stations.

US319 In the bands 137-138 MHz, 148-149.9 MHz, 149.9-150.05 MHz, 399.9-400.05 MHz, 400.15-401 MHz, 1610-1626.5 MHz, and 2483.5-2500 MHz, Federal stations in the mobile-satellite service shall be limited to earth stations operating with non-Federal space stations.

US320 The use of the bands 137-138 MHz, 148-150.05 MHz, 399.9-400.05 MHz, and 400.15-401 MHz by the mobile-satellite service is limited to non-voice, non-geostationary satellite systems and may include satellite links between land earth stations at fixed locations.

US321 The band 535-1705 kHz is also allocated to the non-Federal mobile service on a secondary basis for the distribution of public service information from Travelers' Information Stations operating in accordance with the provisions of 47 C.F.R. § 90.242 on 10 kilohertz spaced channels from 540 kHz to 1700 kHz.

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US324 Federal and non-Federal satellite systems in the 400.15-401 MHz band shall be subject to electromagnetic compatibility analysis and coordination.

US325 In the band 148-149.9 MHz fixed and mobile stations shall not claim protection from land earth stations in the mobile-satellite service that have been previously coordinated; Federal fixed and mobile stations exceeding 27 dBW EIRP, or an emission bandwidth greater than 38 kHz, will be coordinated with existing mobile-satellite service space stations.

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US334 In the band 17.8-20.2 GHz, Federal space stations in both geostationary (GSO) and non-geostationary satellite orbits (NGSO) and associated earth stations in the fixed-satellite service (space-to-Earth) may be authorized on a primary basis. For a Federal geostationary satellite network to operate on a primary basis, the space station shall be located outside the arc, measured from east to west, 70 West Longitude to 120 West Longitude. Coordination between Federal fixed-satellite systems and non-Federal space and terrestrial systems operating in accordance with the United States Table of Frequency Allocations is required.

(a) In the sub-band 17.8-19.7 GHz, the power flux-density at the surface of the Earth produced by emissions from a Federal GSO space station or from a Federal space station in a NGSO constellation of 50 or fewer satellites, for all conditions and for all methods of modulation, shall not exceed the following values in any 1 MHz band:

(1) -115 dB(W/m²) for angles of arrival above the horizontal plane (δ) between 0° and 5°,

(2) -115 + 0.5(δ - 5) dB(W/m²) for δ between 5° and 25°, and

(3) -105 dB(W/m²) for δ between 25° and 90°.

(b) In the sub-band 17.8-19.3 GHz, the power flux-density at the surface of the Earth produced by emissions from a Federal space station in an NGSO constellation of 51 or more satellites, for all conditions and for all methods of modulation, shall not exceed the following values in any 1 MHz band:

(1) -115 - X dB(W/m²) for δ between 0° and 5°,

(2) -115 - X + ((10 + X)/20)(δ - 5) dB(W/m²) for δ between 5° and 25°, and

(3) -105 dB(W/m²) for δ between 25° and 90°; where X is defined as a function of the number of satellites, n, in an NGSO constellation as follows:

For $n \leq 288$, $X = (5/119)(n - 50)$ dB; and

For $n > 288$, $X = (1/69)(n + 402)$ dB.

US335 The primary Federal and non-Federal allocations for the various segments of the 220-222 MHz band are divided as follows: (1) the 220.0-220.55/221.0-221.55, 220.6-220.8/221.6-221.8, 220.85-220.90/221.85-221.90 and 220.925-221.0/221.925-222.0 MHz bands (Channels 1-110, 121-160, 171-180 and 186-200, respectively) are available for exclusive non-Federal use; (2) the 220.55-220.60/221.55-221.60 MHz bands (Channels 111-120) are available for exclusive Federal use; and (3) the 220.80-220.85/221.80-221.85 and 220.900-220.925/221.900-221.925 MHz bands (Channels 161-170 and 181-185, respectively) are available for shared Federal and non-Federal use. The exclusive non-Federal band segments are also available for temporary fixed geophysical telemetry operations on a secondary basis to the fixed and mobile services.

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US339 The bands 2310-2320 and 2345-2360 MHz are also available for aeronautical telemetering and associated telecommand operations for flight testing of manned or unmanned aircraft, missiles or major components thereof on a secondary basis to the Wireless Communications Service. The following two frequencies are shared on a co-equal basis by Federal and non-Federal stations for telemetering and

associated telecommand operations of expendable and re-usable launch vehicles whether or not such operations involve flight testing: 2312.5 and 2352.5 MHz. Other mobile telemetering uses may be provided on a non-interference basis to the above uses. The broadcasting-satellite service (sound) during implementation should also take cognizance of the expendable and reusable launch vehicle frequencies 2312.5 and 2352.5 MHz, to minimize the impact on this mobile service use to the extent possible.

US340 The band 2-30 MHz is available on a non-interference basis to Federal and non-Federal maritime and aeronautical stations for the purposes of measuring the quality of reception on radio channels. See 47 C.F.R. § 87.149 for the list of protected frequencies and bands within this frequency range. Actual communications shall be limited to those frequencies specifically allocated to the maritime mobile and aeronautical mobile services.

US342 In making assignments to stations of other services to which the bands:

13360-13410 kHz	22.01-22.21 GHz*	111.8-114.25 GHz
25550-25670 kHz	22.21-22.5 GHz	128.33-128.59 GHz*
37.5-38.25 MHz	22.81-22.86 GHz*	129.23-129.49 GHz*
322-328.6 MHz*	23.07-23.12 GHz*	130-134 GHz
1330-1400 MHz*	31.2-31.3 GHz	136-148.5 GHz
1610.6-1613.8 MHz*	36.43-36.5 GHz*	151.5-158.5 GHz
1660-1660.5 MHz*	42.5-43.5 GHz	168.59-168.93 GHz*
1668.4-1670 MHz*	42.77-43.17 GHz*	171.11-171.45 GHz*
3260-3267 MHz*	43.07-43.17 GHz*	172.31-172.65 GHz*
3332-3339 MHz*	43.37-43.47 GHz*	173.52-173.85 GHz*
3345.8-3352.5 MHz*	48.94-49.04 GHz*	195.75-196.15 GHz*
4825-4835 MHz*	76-86 GHz	209-226 GHz
4950-4990 MHz	92-94 GHz	241-250 GHz
6650-6675.2 MHz*	94.1-100 GHz	252-275 GHz
14.47-14.5 GHz*	102-109.5 GHz	

are allocated (*indicates radio astronomy use for spectral line observations), all practicable steps shall be taken to protect the radio astronomy service from harmful interference. Emissions from spaceborne or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 4.5 and 4.6 and Article 29 of the ITU Radio Regulations).

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US344 In the band 5091-5250 MHz, non-Federal earth stations in the fixed-satellite service (Earth-to-space) shall be coordinated through the Frequency Assignment Subcommittee (see Recommendation ITU-R S.1342). In order to better protect the operation of the international standard system (microwave landing system) in the band 5000-5091 MHz, non-Federal tracking and telecommand operations should be conducted in the band 5150-5250 MHz.

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US347 In the band 2025-2110 MHz, non-Federal Earth-to-space and space-to-space transmissions may be authorized in the space research and Earth exploration-satellite services subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not cause harmful interference to Federal and non-Federal stations operating in accordance with the Table of Frequency Allocations.

US348 The band 3650-3700 MHz is also allocated to the Federal radiolocation service on a primary basis at the following sites: St. Inigoes, MD (38° 10' N, 76° 23' W); Pascagoula, MS (30° 22' N, 88° 29' W); and Pensacola, FL (30° 21' 28" N, 87° 16' 26" W). All fixed and fixed satellite operations within 80 kilometers of these sites shall be coordinated through the Frequency Assignment Subcommittee of the Interdepartmental Radio Advisory Committee on a case-by-case basis.

US349 The band 3650-3700 MHz is also allocated to the Federal radiolocation service on a non-interference basis for use by ship stations located at least 44 nautical miles in off-shore ocean areas on the condition that harmful interference is not caused to non-Federal operations.

US350 In the band 1427-1432 MHz, Federal use of the land mobile service and non-Federal use of the fixed and land mobile services is limited to telemetry and telecommand operations as described below:

(a) Medical operations. The use of the band 1427-1432 MHz for medical telemetry and telecommand operations (medical operations) shall be authorized for both Federal and non-Federal stations.

(1) Medical operations shall be authorized on a primary basis in the band 1427-1429.5 MHz and on a secondary basis in the band 1429.5-1432 MHz in the United States and its insular areas, except in the following locations: Austin/Georgetown, TX; Detroit and Battle Creek, MI; Pittsburgh, PA; Richmond/Norfolk, VA; Spokane, WA; and Washington, DC metropolitan area (collectively, the "carved-out" locations). See 47 C.F.R. §§ 90.259(b)(4) and 95.630(b) for a detailed description of these locations.

(2) In the carved-out locations, medical operations shall be authorized on a primary basis in the band 1429-1431.5 MHz and on a secondary basis in the bands 1427-1429 MHz and 1431.5-1432 MHz.

(b) Non-medical operations. The use of the band 1427-1432 MHz for non-medical telemetry and telecommand operations (non-medical operations) shall be limited to non-Federal stations.

(1) Non-medical operations shall be authorized on a secondary basis to the Wireless Medical Telemetry Service (WMTS) in the band 1427-1429.5 MHz and on a primary basis in the band 1429.5-1432 MHz in the United States and its insular areas, except in the carved-out locations.

(2) In the carved-out locations, non-medical operations shall be authorized on a secondary basis in the band 1429-1431.5 MHz and on a primary basis in the bands 1427-1429 MHz and 1431.5-1432 MHz.

US351 In the band 1390-1400 MHz, Federal operations, except for medical telemetry operations in the sub-band 1395-1400 MHz, are on a non-interference basis to authorized non-Federal operations and shall not hinder implementation of any non-Federal operations. However, Federal operations authorized as of March 22, 1995 at 17 sites identified below will be continued on a fully protected basis until January 1, 2009.

Sites	Lat/Long	Radius	Sites	Lat/Long	Radius
Eglin AFB, FL	30°28'N/086°31'W	80 km	Ft. Greely, AK	63°47'N/145°52'W	80 km
Dugway PG, UT	40°11'N/112°53'W	80	Ft. Rucker, AL	31°13'N/085°49'W	80
China Lake, CA	35°41'N/117°41'W	80	Redstone, AL	34°35'N/086°35'W	80
Ft. Huachuca, AZ	31°33'N/110°18'W	80	Utah Test Range, UT	40°57'N/113°05'W	80
Cherry Point, NC	34°57'N/076°56'W	80	WSM Range, NM	32°10'N/106°21'W	80
Patuxent River, MD	38°17'N/076°25'W	80	Holloman AFB, NM	33°29'N/106°50'W	80
Aberdeen PG, MD	39°29'N/076°08'W	80	Yuma, AZ	32°29'N/114°20'W	80
Wright-Patterson AFB, OH	39°50'N/084°03'W	80	Pacific Missile Range, CA	34°07'N/119°30'W	80
Edwards AFB, CA	34°54'N/117°53'W	80			

US352 In the band 1427-1432 MHz, Federal operations, except for medical telemetry and medical telecommand operations, are on a non-interference basis to authorized non-Federal operations and shall not hinder the implementation of any non-Federal operations.

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US359 In the band 15.43-15.63 GHz, use of the fixed-satellite service (Earth-to-space) is limited to non-Federal feeder links of non-geostationary systems in the mobile-satellite service. These non-Federal earth stations shall be coordinated through the Frequency Assignment Subcommittee (see Annex 3 of Recommendation ITU-R S.1340).

US360 In the band 33-36 GHz, the Federal fixed-satellite service (space-to-Earth) is also allocated on a primary basis. Coordination between Federal fixed-satellite service systems and non-Federal systems operating in accordance with the United States Table of Frequency Allocations is required.

US361 In the band 1432-1435 MHz, Federal stations in the fixed and mobile services may operate indefinitely on a primary basis at the 23 sites listed below. All other Federal stations in the fixed and mobile services shall operate in the band 1432-1435 MHz on a primary basis until reaccommodated in accordance with the National Defense Authorization Act of 1999.

Location	North Latitude/ West Longitude	Operating Radius	Location	North Latitude/ West Longitude	Operating Radius
China Lake/ Edwards AFB, CA	35° 29' / 117° 16'	100 km	AUTEC	24° 30' / 078° 00'	80 km
White Sands Missile Range/Holloman AFB, NM	32° 11' / 106° 20'	160 km	Beaufort MCAS, SC	32° 26' / 080° 40'	160 km
Utah Test and Training Range/ Dugway Proving Ground, Hill AFB, UT	40° 57' / 113° 05'	160 km	MCAS Cherry Point, NC	34° 54' / 076° 53'	100 km
Patuxent River, MD	38° 17' / 076° 24'	70 km	NAS Cecil Field, FL	30° 13' / 081° 52'	160 km
Nellis AFB, NV	37° 29' / 114° 14'	130 km	NAS Fallon, NV	39° 30' / 118° 46'	100 km
Fort Huachuca, AZ	31° 33' / 110° 18'	80 km	NAS Oceana, VA	36° 49' / 076° 01'	100 km
Eglin AFB/Gulfport ANG Range, MS/Fort Rucker, AL	30° 28' / 086° 31'	140 km	NAS Whidbey Island, WA	48° 21' / 122° 39'	70 km
Yuma Proving Ground, AZ	32° 29' / 114° 20'	160 km	NCTAMS, GUM	13° 35' / 144° 51' (East)	80 km
Fort Greely, AK	63° 47' / 145° 52'	80 km	Lemoore, CA	36° 20' / 119° 57'	120 km
Redstone Arsenal, AL	34° 35' / 086° 35'	80 km	Savannah River, SC	33° 15' / 081° 39'	3 km
Alpene Range, MI	44° 23' / 083° 20'	80 km	Naval Space Operations Center, ME	44° 24' / 068° 01'	80 km
Camp Shelby, MS	31° 20' / 089° 18'	80 km			

US362 The band 1670-1675 MHz is allocated to the meteorological-satellite service (space-to-Earth) on a primary basis for Federal use. Earth station use of this allocation is limited to Wallops Island, VA (37° 56' 47" N, 75° 27' 37" W), Fairbanks, AK (64° 58' 36" N, 147° 31' 03" W), and Greenbelt, MD (39° 00' 02" N, 76° 50' 31" W). Applicants for non-Federal stations within 100 kilometers of the Wallops Island or Fairbanks coordinates and within 65 kilometers of the Greenbelt coordinates shall notify NOAA in accordance with the procedures specified in 47 CFR § 1.924.

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US366 On March 25, 2007, the bands 5900-5950 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13570-13600 kHz, 13800-13870 kHz, 15600-15800 kHz, 17480-17550 kHz, and 18900-19020 are allocated exclusively to the broadcasting service.

(a) As of March 25, 2007, authority to operate new Federal stations in the fixed service may be extended in all of the above listed frequency bands and authority to operate new Federal stations in the mobile except aeronautical mobile service may be extended in the bands 5900-5950 kHz, 13570-13600 kHz, and 13800-13870 kHz. As of March 25, 2007, all Federal stations shall: (1) be limited to communications only within the United States and its insular areas; (2) not cause harmful interference to the broadcasting service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU Radio Regulations.

(b) As of March 25, 2007, authority to operate new non-Federal stations in the fixed and mobile except aeronautical mobile services shall not be extended in any of the above listed frequency bands. As of March 25, 2007, non-Federal stations in the: (1) fixed service may continue to use the bands 5900-5950 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13800-13870 kHz, and 15600-15800 kHz; and (2) mobile except aeronautical mobile service may continue to use the band 5900-5950 kHz. As of March 25, 2007, non-Federal stations shall: (1) be limited to communications only within the United States and its insular areas; (2) not cause harmful interference to the broadcasting

service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU Radio Regulations.

US367 On the condition that harmful interference is not caused to the broadcasting service, frequencies in the bands 9775-9900 kHz, 11650-11700 kHz, and 11975-12050 kHz may be used by Federal stations in the fixed service communicating within the United States and its insular areas that are authorized as of June 12, 2003. Each such station shall be limited to a total radiated power of 24 dBW.

US368 The use of the bands 1390-1392 MHz and 1430-1432 MHz by the fixed-satellite service is limited to feeder links for the Non-Voice Non-Geostationary Mobile-Satellite Service and is contingent on: (1) the completion of ITU-R studies on all identified compatibility issues as shown in Annex 1 of Resolution 745 (WRC-2003); (2) measurement of emissions from equipment that would be employed in operational systems and demonstrations to validate the studies as called for in Resolution 745 (WRC-2003); and (3) compliance with any technical and operational requirements that may be imposed at WRC-07 to protect other services in these bands and passive services in the band 1400-1427 MHz from unwanted emissions. The FCC shall coordinate individual assignments with NTIA (see, for example, Recommendations ITU-R RA.769-2 and ITU-R SA.1029-2) to ensure the protection of passive services in the band 1400-1427 MHz. As part of the coordination requirements, the feeder uplink and downlink systems shall be tested and certified to be in conformance with the technical and operational out-of-band requirements for the protection of passive services in the band 1400-1427 MHz. Certification and all supporting documentation shall be submitted to the FCC at least three months prior to launch.

* * * * *

US378 In the band 1710-1755 MHz, Federal stations in the fixed and mobile services shall operate on a primary basis until reaccommodated in accordance with the Commercial Spectrum Enhancement Act. Further, Federal stations may continue to operate in the band 1710-1755 MHz as provided below:

(a) Federal fixed microwave and tactical radio relay stations may operate indefinitely on a primary basis at the sites listed below:

Location	Coordinates	Radius of Operation (km)
Cherry Point, NC…..…….....	34° 58' N 076° 56' W	80
Yuma, AZ…….....	32° 32' N 113° 58' W	80

(b) Federal fixed microwave and tactical radio relay stations may operate on a secondary basis, and shall not cause harmful inference to, and must accept harmful interference from, primary non-Federal operations at the sites listed below:

Location	Coordinates	Radius of Operation (km)
China Lake, CA…….…..	35° 41' N 117° 41' W	80
Eglin AFB, FL…….….....	30° 29' N 086° 31' W	80
Pacific Missile Test Range/Point Mugu, CA..	34° 07' N 119° 30' W	80
Nellis AFB, NV……...……....	36° 14' N 115° 02' W	80
Hill AFB, UT……..	41° 07' N 111° 58' W	80
Patuxent River, MD……	38° 17' N 076° 25' W	80
White Sands Missile Range, NM……	33° 00' N 106° 30' W	80
Fort Irwin, CA…….	35° 16' N 116° 41' W	50
Fort Rucker, AL……..	31° 13' N 085° 49' W	50
Fort Bragg, NC……	35° 09' N 079° 01' W	50
Fort Campbell, KY……..	36° 41' N 087° 28' W	50
Fort Lewis, WA……...……...	47° 05' N 122° 36' W	50
Fort Benning, GA……	32° 22' N 084° 56' W	50
Fort Stewart, GA…….....	31° 52' N 081° 37' W	50

(c) In the sub-band 1710-1720 MHz, precision guided munitions shall operate on a primary basis until inventory is exhausted or until December 31, 2008, whichever is earlier.

* * * * *

US380 In the bands 1525-1544 MHz, 1545-1559 MHz, 1610-1645.5 MHz, 1646.5-1660.5 MHz, 2000-2020 MHz, 2180-2200 MHz, and 2483.5-2500 MHz, a non-Federal licensee in the mobile-satellite service (MSS) may also operate an ancillary terrestrial component in conjunction with its MSS network, subject to the Commission's rules for ancillary terrestrial components and subject to all applicable conditions and provisions of its MSS authorization.

* * * * *

US382 In the band 39.5-40 GHz, Federal earth stations in the mobile-satellite service (space-to-Earth) shall not claim protection from non-Federal stations in the fixed and mobile services. ITU Radio Regulation No. 5.43A does not apply.

US384 In the band 401-403 MHz, the non-Federal Earth exploration-satellite (Earth-to-space) and meteorological-satellite (Earth-to-space) services are limited to earth stations transmitting to Federal space stations.

* * * * *

US389 In the bands 71-76 GHz and 81-86 GHz, stations in the fixed, mobile, and broadcasting services shall not cause harmful interference to, nor claim protection from, Federal stations in the fixed-satellite service at any of the following 28 military installations:

Military Installation	State	Nearby city
Redstone Arsenal…….....	AL	Huntsville
Fort Huachuca……	AZ	Sierra Vista
Yuma Proving Ground…….....	AZ	Yuma
Beale AFB……..	CA	Marysville
Camp Parks Reserve Forces Training Area……...……	CA	Dublin
China Lake Naval Air Weapons Station……	CA	Ridgecrest
Edwards AFB…….	CA	Rosamond
Fort Irwin……...……	CA	Barstow
Marine Corps Air Ground Combat Center……...….	CA	Twentynine Palms
Buckley AFB……..……..…….	CO	Aurora (Denver)
Schriever AFB……...…	CO	Colorado Springs
Fort Gordon…….....	GA	Augusta
Naval Satellite Operations Center……...…..	GU	Finegayan (Territory of Guam)
Naval Computer and Telecommunications Area Master Station, Pacific…..…….....	HI	Wahiawa (Oahu Is.)
Fort Detrick……	MD	Frederick
Nellis AFB…….	NV	Las Vegas
Nevada Test Site……	NV	Amargosa Valley
Tonapah Test Range Airfield……...…….	NV	Tonapah
Cannon AFB…….....	NM	Clovis
White Sands Missile Range…….....	NM	White Sands
Dyess AFB…….	TX	Abilene
Fort Bliss……	TX	El Paso
Fort Sam Houston……..	TX	San Antonio
Goodfellow AFB……	TX	San Angelo
Kelly AFB…….……...……..	TX	San Antonio
Utah Test and Training Range…….……..	UT	…..
Fort Belvoir……	VA	Alexandria
Naval Satellite Operations Center..……...…….	VA	Chesapeake

US390 Federal stations in the space research service (active) operating in the band 5350-5460 MHz shall not cause harmful interference to, nor claim protection from, Federal and non-Federal stations in the aeronautical radionavigation service nor Federal stations in the radiolocation service.

US391 In the band 2495-2500 MHz, the mobile-satellite service (space-to-Earth) shall not receive protection from non-Federal stations in the fixed and mobile except aeronautical mobile services operating in that band.

* * * * *

US394 Until March 29, 2009, the band 6765-7000 kHz is allocated to the fixed service on a primary basis and to the mobile service on a secondary basis. After this date, this band is allocated to the fixed and the mobile except aeronautical mobile (R) services on a primary basis.

US395 Until March 29, 2009, the use of the band 7100-7200 kHz in Region 1 and Region 3 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3.

US396 The band 7300-7400 kHz is allocated exclusively to the broadcasting service in accordance with the schedule specified below, except that the sub-band 7368.5-7371.3 kHz is allocated to the fixed service on an exclusive basis for non-Federal use within the State of Alaska in accordance with 47 C.F.R. § 80.387.

(a) Until March 25, 2007, the band 7300-7350 kHz is allocated to the fixed service on a primary basis and to the mobile except aeronautical mobile service on a secondary basis for Federal and non-Federal use. After March 25, 2007, authority to operate in the band 7300-7350 kHz shall not be extended to new non-Federal stations in the fixed and mobile except aeronautical mobile services. After March 25, 2007, kHz), Federal and non-Federal stations in the fixed and mobile except aeronautical mobile services shall: (1) be limited to communications wholly within the United States and its insular areas; (2) not cause harmful interference to the broadcasting service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU Radio Regulations.

(b) Until March 29, 2009, the band 7350-7400 kHz is allocated to the fixed service on a primary basis and to the mobile except aeronautical mobile service on a secondary basis for Federal and non-Federal use. After March 29, 2009, authority to operate in the band 7350-7400 kHz shall not be extended to new non-Federal stations in the fixed and mobile except aeronautical mobile services. After March 29, 2009, Federal and non-Federal stations in the fixed and mobile except aeronautical mobile services shall: (1) be limited to communications wholly within the United States and its insular areas; (2) not cause harmful interference to the broadcasting service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU Radio Regulations.

US397 In the band 432-438 MHz, the Earth exploration-satellite service (active) is allocated on a secondary basis for Federal use. Stations in the Earth exploration-satellite service (active) shall not be operated within line-of-sight of United States except for the purpose of short duration pre-operational testing. Operations under this allocation shall not cause harmful interference to, nor claim protection from, any other services allocated in the band 432-438 MHz in the United States, including secondary services and the amateur-satellite service.

US398 In the bands 1390-1400 MHz and 1427-1432 MHz, airborne and space-to-Earth operations, except for feeder downlinks for the Non-Voice Non-Geostationary Mobile-Satellite Service in the band 1430-1432 MHz (see US368), are prohibited.

NON-FEDERAL GOVERNMENT (NG) FOOTNOTES

(These footnotes, each consisting of the letters ''NG'' followed by one or more digits, denote stipulations applicable only to non-Federal operations and thus appear solely in the non-Federal Table.)

* * * * *

NG42 In the band 10-10.5 GHz, non-Federal stations in the radiolocation service shall not cause harmful interference to the amateur service.

* * * * *

NG134 In the band 10.45-10.5 GHz, non-Federal stations in the radiolocation service shall not cause harmful interference to the amateur and amateur-satellite services.

* * * * *

NG142 TV broadcast stations authorized to operate in the bands 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-806 MHz may use a portion of the television vertical blanking interval for the transmission of telecommunications signals, on the condition that harmful interference will not be caused to the reception of primary services, and that such telecommunications services must accept any interference caused by primary services operating in these bands.

* * * * *

NG152 The use of the band 219-220 MHz by the amateur service is limited to stations participating, as forwarding stations, in point-to-point fixed digital message forwarding systems, including intercity packet backbone networks.

* * * * *

NG160 In the 5850-5925 MHz band, the use of the non-Federal mobile service is limited to Dedicated Short Range Communications operating in the Intelligent Transportation System radio service.

* * * * *

NG169 After December 1, 2000, operations on a primary basis by the fixed-satellite service (space-to-Earth) in the band 3650-3700 MHz shall be limited to grandfathered earth stations. All other fixed-satellite service earth station operations in the band 3650-3700 MHz shall be on a secondary basis. Grandfathered earth stations are those authorized prior to December 1, 2000, or granted as a result of an application filed prior to December 1, 2000, and constructed within 12 months of initial authorization. License applications for primary operations for new earth stations, major amendments to pending earth station applications, or applications for major modifications to earth station facilities filed on or after December 18, 1998, and prior to December 1, 2000, shall not be accepted unless the proposed facilities are within 16.1 kilometers (10 miles) of an authorized primary earth station operating in the band 3650-3700 MHz. License applications for primary operations by new earth stations, major amendments to pending earth station applications, and applications for major modifications to earth station facilities, filed after December 1, 2000, shall not be accepted, except for changes in polarization, antenna orientation or ownership of a grandfathered earth station.

* * * * *

FEDERAL GOVERNMENT (G) FOOTNOTES

(These footnotes, each consisting of the letter ''G'' followed by one or more digits, denote stipulations applicable only to Federal operations and thus appear solely in the Federal Table.)

G2 In the bands 216-217 MHz, 220-225 MHz, 420-450 MHz (except as provided by US217 and G129), 890-902 MHz, 928-942 MHz, 1300-1390 MHz, 2310-2390 MHz, 2417-2450 MHz, 2700-2900 MHz, 5650-5925 MHz, and 9000-9200 MHz, the Federal radiolocation service is limited to the military services.

* * * * *

G8 Low power Federal radio control operations are permitted in the band 420-450 MHz.

G11 Federal fixed and mobile radio services, including low power radio control operations, are permitted in the band 902-928 MHz on a secondary basis.

* * * * *

G31 In the band 3300-3500 MHz, the use of the Federal radiolocation service is limited to the military services, except as provided by footnote US108.

G32 Except for weather radars on meteorological satellites in the band 9975-10025 MHz and for Federal survey operations (see footnote US108), Federal radiolocation in the band 10-10.5 GHz is limited to the military services.

* * * * *

G42 The space operation service (Earth-to-space) is limited to the band 1761-1842 MHz, and is limited to space command, control, range and range rate systems.

G56 Federal radiolocation in the bands 1215-1300, 2900-3100, 5350-5650 and 9300-9500 MHz is primarily for the military services; however, limited secondary use is permitted by other Federal agencies in support of experimentation and research programs. In addition, limited secondary use is permitted for survey operations in the band 2900-3100 MHz.

G59 In the bands 902-928 MHz, 3100-3300 MHz, 3500-3650 MHz, 5250-5350 MHz, 8500-9000 MHz, 9200-9300 MHz, 13.4-14.0 GHz, 15.7-17.7 GHz and 24.05-24.25 GHz, all Federal non-military radiolocation shall be secondary to military radiolocation, except in the sub-band 15.7-16.2 GHz airport surface detection equipment (ASDE) is permitted on a co-equal basis subject to coordination with the military departments.

* * * * *

G110 Federal ground-based stations in the aeronautical radionavigation service may be authorized between 3500-3650 MHz when accommodation in the band 2700-2900 MHz is not technically and/or economically feasible.

* * * * *

G117 In the bands 7.25-7.75 GHz, 7.9-8.4 GHz, 17.8-21.2 GHz, 30-31 GHz, 33-36 GHz, 39.5-41 GHz, 43.5-45.5 GHz and 50.4-51.4 GHz, the Federal fixed-satellite and mobile-satellite services are limited to military systems.

G118 Federal fixed stations may be authorized in the band 1700-1710 MHz only if spectrum is not available in the band 1755-1850 MHz.

* * * * *

G123 The bands 2300-2310 and 2400-2402 MHz were identified for reallocation, effective August 10, 1995, for exclusive non-Federal use under Title VI of the Omnibus Budget Reconciliation Act of 1993. Effective August 10, 1995, any Federal operations in these bands are on a non-interference basis to authorized non-Federal operations and shall not hinder the implementation of any non-Federal operations.

G124 The band 2417-2450 MHz was identified for reallocation, effective August 10, 1995, for mixed Federal and non-Federal use under Title VI of the Omnibus Budget Reconciliation Act of 1993.

* * * * *

G129 Federal wind profilers are authorized to operate on a primary basis in the radiolocation service in the frequency band 448-450 MHz with an authorized bandwidth of no more than 2 MHz centered on 449 MHz, subject to the following conditions: 1) wind profiler locations must be pre-coordinated with the military services to protect fixed military radars; and 2) wind profiler operations shall not cause harmful interference to, nor claim protection from, military mobile radiolocation stations that are engaged in critical national defense operations.

G130 Federal stations in the radiolocation service operating in the band 5350-5470 MHz, shall not cause harmful interference to, nor claim protection from, Federal stations in the aeronautical radionavigation service operating in accordance with ITU Radio Regulation No. 5.449.

G131 Federal stations in the radiolocation service operating in the band 5470-5650 MHz, with the exception of ground-based radars used for meteorological purposes operating in the band 5600-5650 MHz, shall not cause harmful interference to, nor claim protection from, Federal stations in the maritime radionavigation service.

G132 Use of the radionavigation-satellite service in the band 1215-1240 MHz shall be subject to the condition that no harmful interference is caused to, and no protection is claimed from, the radionavigation service authorized under ITU Radio Regulation No. 5.331. Furthermore, the use of the radionavigation-satellite service in the band 1215-1240 MHz shall be subject to the condition that no harmful interference is caused to the radiolocation service. ITU Radio Regulation No. 5.43 shall not apply in respect of the radiolocation service. ITU Resolution 608 (WRC-03) shall apply.

G133 No emissions to deep space shall be effected in the band 7190-7235 MHz. Geostationary satellites in the space research service operating in the band 7190-7235 MHz shall not claim protection from existing and future stations of the fixed and mobile services and No. 5.43A does not apply.

PART 25 – SATELLITE COMMUNICATIONS

10. The authority citation for Part 25 continues to read as follows:

AUTHORITY: 47 U.S.C. 701-744. Interprets or applies Sections 4, 301, 302, 303, 307, 309 and 332 of the Communications Act, as amended, 47 U.S.C. Sections 154, 301, 302, 303, 307, 309 and 332, unless otherwise noted.

11. Section 25.208 is amended by adding new paragraph (p) to read as follows:

§ 25.208 Power flux-density limits.

* * * * *

(p) The power flux-density at the Earth's surface produced by emissions from a space station in either the Earth exploration-satellite service in the band 25.5-27 GHz or the inter-satellite service in the band 25.25-27.5 GHz for all conditions and for all methods of modulation shall not exceed the following values:

-115 dB(W/m²) in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;
-115 + 0.5(δ - 5) dB(W/m²) in any 1 MHz band for angles of arrival between 5 and 25 degrees above the horizontal plane;
-105 dB(W/m²) in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

These limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

PART 73 – RADIO BROADCAST SERVICES

12. The authority citation for Part 73 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 303, 334 and 336.

13. Section 73.220 is amended by removing and reserving paragraph (b).

§ 73.220 Restrictions on the use of channels.

* * * * *

(b) [Reserved.]

14. Section 73.603 is amended by removing and reserving paragraph (b).

§ 73.603 Numerical designation of television channels.

* * * * *

(b) [Reserved.]

15. Section 73.701 is amended by revising paragraph (e) to read as follows:

§ 73.701 Definitions.

* * * * *

(e) Coordinated Universal Time (UTC). Time scale, based on the second (SI), as defined in Recommendation ITU-R TF.460-6.

For most practical purposes associated with the ITU Radio Regulations, UTC is equivalent to mean solar time at the prime meridian (0° longitude), formerly expressed in GMT. (RR)

* * * * *

16. Sections 73.702 is amended by revising paragraph (f), by adding new paragraphs (g) and (h), and redesignating paragraphs (g)-(k) as (i)-(m) to read as follows:

§ 73.702 Assignment and use of frequencies.

* * * * *

(f) Exclusive allocations. Where practical, assigned frequencies shall be within the following bands, which are allocated to the broadcasting service on a primary and exclusive basis:

(1) Worldwide allocations. The following bands are allocated to the broadcasting service on a primary and exclusive basis throughout the world: 5950-6200 kHz, 9500-9900 kHz, 11650-12050 kHz, 13600-13800 kHz, 15100-15600 kHz, 17550-17900 kHz, 21450-21850 kHz, and 25670-26100 kHz.

(2) Regional allocation. The band 7200-7300 kHz is allocated to the broadcasting service on a primary and exclusive basis in Region 1 and Region 3.

NOTE: For the allocation of frequencies, the International Telecommunication Union (ITU) has divided the world into three Regions, which are defined in 47 C.F.R. § 2.104(b). The bands 7100-7300 kHz and 7400-7450 kHz are not allocated to the broadcasting service in Region 2.

(g) Co-primary allocations. Frequencies may also be assigned from within the following bands, which are allocated on a primary, but not exclusive, basis to the broadcasting service:

(1) Worldwide allocations. (i) Until April 1, 2007, the following frequency bands are allocated to the broadcasting and fixed services on a co-primary basis throughout the world: 5900-5950 kHz, 7300-7350 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13570-13600 kHz, 13800-13870 kHz, 15600-15800 kHz, 17480-17550 kHz, and 18900-19020 kHz (WARC-92 HFBC bands). In addition, the band 5900-5950 kHz is allocated to the land mobile service on a primary basis in Region 1 and to the mobile except aeronautical mobile (R) service on a primary basis in Region 2 until April 1, 2007. After April 1, 2007, the WARC-92 HFBC bands are allocated to the broadcasting service on an exclusive basis throughout the world.

(ii) Until March 29, 2009, the band 7350-7400 kHz is allocated to the broadcasting and fixed services on a co-primary basis throughout the world. After March 29, 2009, the band 7350-7400 kHz is allocated to the broadcasting service on an exclusive basis throughout the world, except in the countries listed in 47 C.F.R. § 2.106, footnote 5.143C where the band 7350-7400 kHz continues to be allocated to the broadcasting and fixed services on a co-primary basis.

(2) Regional allocations. (i) Until March 29, 2009, the band 7100-7200 kHz is allocated to the amateur and broadcasting services on a co-primary basis in Region 1 and Region 3; however, during this transition period, the use of the band 7100-7200 kHz by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. After March 27, 2005, where practical, requests for frequency assignments in the band 7100-7200 kHz shall be satisfied within the band 7200-7350 kHz. After March 29, 2009, the band 7100-7200 kHz is no longer allocated to the broadcasting service.

(ii) Until March 29, 2009, the band 7400-7450 kHz is allocated to the broadcasting service on a co-primary basis with the fixed service in Region 1 and Region 3. After March 29, 2009, the band 7400-7450 kHz is allocated on an exclusive basis to the broadcasting service in Region 1 and Region 3, except in the countries listed in 47 C.F.R. § 2.106, footnote 5.143C where the band 7400-7450 kHz continues to be allocated to the broadcasting and fixed services on a co-primary basis.

(h) Requirements for Regional operation. (1) Frequency assignments in the bands 7100-7300 kHz (7200-7300 kHz after March 29, 2009) and 7400-7450 kHz shall be limited to international broadcast stations that are located in the Pacific insular areas located in Region 3 (as defined in 47 C.F.R. § 2.105(a), note 4) that transmit to geographical zones and areas of reception in Region 1 or Region 3.

(2) During the hours of 0800-1600 UTC (Coordinated Universal Time) antenna gain with reference to an isotropic radiator in any easterly direction that would intersect any area in Region 2 shall not exceed 2.15 dBi, except in the case where a transmitter power of less than 100 kW is used. In this case, antenna gain on restricted azimuths shall not exceed that which is determined in accordance with equation below. Stations desiring to operate in this band must submit sufficient antenna performance information to ensure compliance with these restrictions. Permitted gain for transmitter powers less than 100 kW:

$$Gi = 2.15 + 10\log\left(\frac{100}{Pa}\right) dBi$$

Where:
Gi = maximum gain permitted with reference to an isotropic radiator.
Pa = Transmitter power employed in kW.

* * * * *

17. Section 73.751 is revised to read as follows:

§ 73.751 Operating power.

No international broadcast station shall be authorized to install, or be licensed for operation of, transmitter equipment with: (a) a rated carrier power of less than 50 kilowatts (kW) if double-sideband (DSB) modulation is used, (b) a peak envelope power of less than 50 kW if single-sideband (SSB) modulation is used, or (c) a mean power of less than 10 kW if digital modulation is used.

18. Section 73.756 is revised to read as follows:

§ 73.756 System specifications for double-sideband (DBS) modulated emissions in the HF broadcasting service.

(a) Channel Spacing. The nominal spacing for DSB shall be 10 kHz. However, the interleaved channels with a separation of 5 kHz may be used in accordance with the relative protection criteria,

provided that the interleaved emission is not to the same geographical area as either of the emissions between which it is interleaved.

(b) Emission Characteristics. (1) Nominal carrier frequencies. Nominal carrier frequencies shall be integral multiples of 5 kHz.

(2) Audio-frequency band. The upper limit of the audio-frequency band (at – 3 dB) of the transmitter shall not exceed 4.5 kHz and the lower limit shall be 150 Hz, with lower frequencies attenuated at a slope of 6 dB per octave.

(3) Modulation processing. If audio-frequency signal processing is used, the dynamic range of the modulating signal shall be not less than 20 dB.

(4) Necessary bandwidth. The necessary bandwidth shall not exceed 9 kHz.

19. Existing Sections 73.757, 73.758, 73.759, and 73.761 are redesignated as Sections 73.759, 73.760, 73.761, and 73.762.

20. New Section 73.757 is added to read as follows:

§73.757 System specifications for single-sideband (SSB) modulated emissions in the HF broadcasting service.

(a) System parameters. (1) Channel spacing. In a mixed DSB, SSB and digital environment (see Resolution 517 (Rev.WRC-03)), the channel spacing shall be 10 kHz. In the interest of spectrum conservation, it is also permissible to interleave SSB emissions midway between two adjacent DSB channels, i.e., with 5 kHz separation between carrier frequencies, provided that the interleaved emission is not to the same geographical area as either of the emissions between which it is interleaved. In an all inclusive SSB environment, the channel spacing and carrier frequency separation shall be 5 kHz.

(2) Equivalent sideband power. When the carrier reduction relative to peak envelope power is 6 dB, an equivalent SSB emission is one giving the same audio-frequency signal-to-noise ratio at the receiver output as the corresponding DSB emission, when it is received by a DSB receiver with envelope detection. This is achieved when the sideband power of the SSB emission is 3 dB larger than the total sideband power of the DSB emission. (The peak envelope power of the equivalent SSB emission and the carrier power are the same as that of the DSB emission.)

(b) Emission Characteristics. (1) Nominal carrier frequencies. Nominal carrier frequencies shall be integral multiples of 5 kHz.

(2) Frequency tolerance. The frequency tolerance shall be 10 Hz.

NOTE 1: The ITU suggests that administrations avoid carrier frequency differences of a few hertz, which cause degradations similar to periodic fading. This could be avoided if the frequency tolerance were 0.1 Hz, a tolerance which would be suitable for SSB emissions.

NOTE 2: The SSB system adopted for the bands allocated exclusively to HF broadcasting does not require a frequency tolerance less than 10 Hz. The degradation mentioned in Note 1 occurs when the ratio of wanted-to-interfering signal is well below the required protection ratio. This remark is equally valid for both DSB and SSB emissions.

(3) Audio-frequency band. The upper limit of the audio-frequency band (at – 3 dB) of the transmitter shall not exceed 4.5 kHz with a further slope of attenuation of 35 dB/kHz and the lower limit shall be 150 Hz with lower frequencies attenuated at a slope of 6 dB per octave.

(4) Modulation processing. If audio-frequency signal processing is used, the dynamic range of the modulating signal shall be not less than 20 dB.

(5) Necessary bandwidth. The necessary bandwidth shall not exceed 4.5 kHz.

(6) Carrier reduction (relative to peak envelope power). In a mixed DSB, SSB and digital environment, the carrier reduction shall be 6 dB to allow SSB emissions to be received by conventional DSB receivers with envelope detection without significant deterioration of the reception quality.

(7) Sideband to be emitted. Only the upper sideband shall be used.

(8) Attenuation of the unwanted sideband. The attenuation of the unwanted sideband (lower sideband) and of intermodulation products in that part of the emission spectrum shall be at least 35 dB relative to the wanted sideband signal level. However, since there is in practice a large difference between signal amplitudes in adjacent channels, a greater attenuation is recommended.

21. New Section 73.758 is added to read as follows:

§ 73.758 System specifications for digitally modulated emissions in the HF broadcasting service.

(a) For digitally modulated emissions, the Digital Radio Mondiale (DRM) standard shall be employed. Both digital audio broadcasting and datacasting are authorized. The RF requirements for the DRM system are specified in paragraphs (b) and (c), below.

(b) System parameters. (1) Channel spacing. The initial spacing for digitally modulated emissions shall be 10 kHz. However, interleaved channels with a separation of 5 kHz may be used in accordance with the appropriate protection criteria appearing in Resolution 543 (WRC-03), provided that the interleaved emission is not to the same geographical area as either of the emissions between which it is interleaved.

(2) Channel utilization. Channels using digitally modulated emissions may share the same spectrum or be interleaved with analog emissions in the same high frequency broadcasting (HFBC) band, provided the protection afforded to the analog emissions is at least as great as that which is currently in force for analog-to-analog protection. Accomplishing this may require that the digital spectral power density (and total power) be lower by several dB than is currently used for either DSB or SSB emissions.

(c) Emission characteristics. (1) Bandwidth and center frequency. A full digitally modulated emission will have a 10 kHz bandwidth with its center frequency at any of the 5 kHz center frequency locations in the channel raster currently in use within the HFBC bands. Among several possible "simulcast" modes are those having a combination of analog and digital emissions of the same program in the same channel, that may use a digital emission of 5 kHz or 10 kHz bandwidth, next to either a 5 kHz or 10 kHz analog emission. In all cases of this type, the 5 kHz interleaved raster used in HFBC shall be adhered to in placing the emission within these bands.

(2) Frequency tolerance. The frequency tolerance shall be 10 Hz. See Section 73.757(b)(2), notes 1 and 2.

(3) Audio-frequency band. The quality of service, using digital source coding within a 10 kHz bandwidth, taking into account the need to adapt the emission coding for various levels of error avoidance, detection and correction, can range from the equivalent of monophonic FM (approximately 15 kHz) to the low-level performance of a speech codec (of the order of 3 kHz). The choice of audio quality is connected to the needs of the broadcaster and listener, and includes the consideration of such characteristics as the propagation conditions expected. There is no single specification, only the upper and lower bounds noted in this paragraph.

(4) Modulation. Quadrature amplitude modulation (QAM) with orthogonal frequency division multiplexing (OFDM) shall be used. 64-QAM is feasible under many propagation conditions; others such as 32-, 16- and 8-QAM are specified for use when needed.

(5) RF protection ratio values. The protection ratio values for analogue and digital emissions for co-channel and adjacent channel conditions shall be in accordance with Resolution 543 (WRC-03) as provisional RF protection ratio values subject to revision or confirmation by a future competent conference.

22. Section 73.766 is removed and reserved:

§ 73.766 Modulation and bandwidth.

[Reserved]

PART 90 – PRIVATE LAND MOBILE RADIO SERVICES

23. The authority citation for Part 90 continues to read as follows:

AUTHORITY: Sections 4(I), 11, 303(g), 303(r), and 332(c)(7) of the Communications Act of 1934, as amended, 47 U.S.C. 154(I), 161, 303(g), 303(r), 332(c)(7).

24. Section 90.20 is amended by revising paragraph (c)(3) and by adding paragraph (d)(88) to read as follows:

§ 90.20 Public Safety Pool.

* * * * *

(c) * * *

(3) Frequencies.

PUBLIC SAFETY POOL FREQUENCY TABLE

Frequency or band	Class of station(s)	Limitations	Coordinator
Kilohertz			
*	*	*	*
2000 to 10,000……..…	Fixed, base, or mobile...	6, 88……...	PX
Megahertz			
*	*	*	*
159.4725……..….	…..do……	80……..	PO
*	*	*	*

(d) * * *

* * * * *

(88) As of March 25, 2007, the FCC will cease to issue licenses for new stations in the fixed and mobile services in the following bands: 5900-5950 kHz, 7300-7350 kHz and 9400-9500 kHz. As of March 29, 2009, the FCC will cease to issue licenses for new stations in the fixed and mobile services in the band 7350-7400 kHz and, in the U.S. Pacific insular areas in Region 3, the band 7400-7450 kHz. Stations licensed as of March 25, 2007 in the bands 5900-5950 kHz, 7300-7350 kHz and 9400-9500 kHz and as of March 29, 2009 for the band 7350-7400 kHz in Region 2 and the band 7350-7450 kHz in Region 3 shall: (1) be limited to communications only within the United States and its insular areas; (2) not cause harmful interference to the broadcasting service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU Radio Regulations.

25. Section 90.35 is amended by revising paragraphs (b)(3) and (c)(90) to read as follows:

§ 90.35 Industrial/Business Pool.

* * * * *

(b) * * *

(3) Frequencies.

INDUSTRIAL/BUSINESS POOL FREQUENCY TABLE

Frequency or band	Class of station(s)	Limitations	Coordinator
Kilohertz			
*	*	*	*
2000 to 25,000……	Fixed, base or mobile...	1, 90……...	
Megahertz			
*	*	*	*

* * * * *

(c) * * *

* * * * *

(90) As of March 25, 2007, the FCC will cease to issue licenses for new stations in the fixed and mobile services in the following bands: 5900-5950 kHz, 7300-7350 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13800-13870 kHz, and 15600-15800 kHz. As of March 29, 2009, the FCC will cease to issue licenses for new stations in the fixed and mobile services in the band 7350-7400 kHz and, in the U.S. Pacific insular areas in Region 3, the band 7400-7450 kHz. Stations licensed as of March 25, 2007 in the bands 5900-5950 kHz, 7300-7350 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13800-13870 kHz, and 15600-15800 kHz and as of March 29, 2009 for the band 7350-7400 kHz in Region 2 and the band 7350-7450 kHz in Region 3 shall: (1) be limited to communications only within the United States and its insular areas; (2) not cause harmful interference to the broadcasting service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU Radio Regulations.

PART 97 – AMATEUR RADIO SERVICE

26. The authority citation for part 97 continues to read as follows:

AUTHORITY: 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303. Interpret or apply 48 Stat. 1064-1068, 1081-1105, as amended; 47 U.S.C. 151-155, 301-609, unless otherwise noted.

27. Section 97.301 is amended by revising the tables following paragraph (a), (b), (c), (d), and (e) to read as follows:

§ 97.301 Authorized frequency bands.

* * *

(a) * * *

Wavelength band	ITU – Region 1	ITU – Region 2	ITU – Region 3	Sharing requirements see § 97.303 (Paragraph)
*	*	*	*	*
UHF	MHz	MHz	MHz	
*	*	*	*	*
23 cm ……	1240-1300 ….	1240-1300 …..….	1240-1300 …….	(b), (h), (i).
*	*	*	*	*
SHF	GHz	GHz	GHz	
9 cm …….	3.4-3.475……..	3.3-3.5 ……..…..	3.3-3.5 ……..…..	(a), (b), (k), (l).
*	*	*	*	*
EHF	GHz	GHz	GHz	
6 mm ……	47.0-47.2 ……..	47.0-47.2 ……...	47.0-47.2 …….	
4 mm ……	75.5-81.0 …..…	75.5-81.0 ……..….	75.5-81.0 …….....	(b), (c), (h), (k), (r).
2.5 mm …….	122.25-123 …..	122.25-123 ……...	122.25-123 ……..	(p).
2 mm ……	134-141 ……	134-141 …….	134-141 ……...	(b), (c), (h), (k).
1 mm ……	241-250 ……	241-250 …….	241-250 ……...	(b), (c), (h), (k), (q).
……..	above 275 …….	above 275 ……...	above 275 ……	(k).

(b) * * *

Wavelength band	ITU – Region 1	ITU – Region 2	ITU – Region 3	Sharing requirements see § 97.303 (Paragraph)
*	*	*	*	*
HF	MHz	MHz	MHz	
*	*	*	*	*
40 m ……	7.0-7.2 …….	7.0-7.2 …….	7.0-7.2 …..…….	(t).
Do…….		7.2-7.3 ……..		(a), (t).
*	*	*	*	*

(c) * * *

Wavelength band	ITU – Region 1	ITU – Region 2	ITU – Region 3	Sharing requirements see § 97.303 (Paragraph)
*	*	*	*	*
HF	MHz	MHz	MHz	
*	*	*	*	*
40 m ……..…	7.025-7.200 …..	7.025-7.200 …..…	7.025-7.200 …..	(t).
Do …….	……..	7.200-7.300 ……..	……..	(a), (t).
*	*	*	*	*

(d) * * *

Wavelength band	ITU – Region 1	ITU – Region 2	ITU – Region 3	Sharing requirements see § 97.303 (Paragraph)
*	*	*	*	*
HF	MHz	MHz	MHz	
*	*	*	*	*
40 m ……	7.025-7.150 ….	7.025-7.150 ..……	7.025-7.150 …..	(t).
Do …….....	…….	7.225-7.300 ……..	……..	(a), (t).
*	*	*	*	*

(e) * * *

Wavelength band	ITU – Region 1	ITU – Region 2	ITU – Region 3	Sharing requirements see § 97.303 (Paragraph)
*	*	*	*	*
HF	MHz	MHz	MHz	
*	*	*	*	*
40 m ……	7.050-7.075 ….	…….....	7.050-7.075	
Do ……	7.100-7.150 ...	7.100-7.150 ….....	7.100-7.150 …..	(t).
*	*	*	*	*

28. Section 97.303 is amended by revising paragraphs (b), (c), (h), (i), (k), and (r); and by adding new paragraph (t) to read as follows:

§ 97.303 Frequency sharing requirements.

* * * * *

(a) Where, in adjacent ITU Regions or sub-Regions, a band of frequencies is allocated to different services of the same category (i.e., primary or secondary allocations), the basic principle is the equality of right to operate. Accordingly, stations of each service in one Region or sub-Region must operate so as not to cause harmful interference to any service of the same or higher category in the other Regions or sub-Regions. (See ITU Radio Regulations, edition of 2004, No. 4.8.)

(b) No amateur station transmitting in the 1900-2000 kHz segment, the 70 cm band, the 33 cm band, the 23 cm band, the 13 cm band, the 9 cm band, the 5 cm band, the 3 cm band, the 24.05-24.25 GHz segment, the 76-77.5 GHz segment, the 78-81 GHz segment, the 136-141 GHz segment, and the 241-248 GHz segment shall not cause harmful interference to, nor is protected from interference due to the operation of, the Federal radiolocation service.

(c) No amateur station transmitting in the 1900-2000 kHz segment, the 3 cm band, the 76-77.5 GHz segment, the 78-81 GHz segment, the 136-141 GHz segment, and the 241-248 GHz segment shall cause harmful interference to, nor is protected from interference due to the operation of, stations in the non-Federal radiolocation service.

* * * * *

(f) * * *

* * * * *

(4) No amateur station transmitting in the 449.75-450.00 MHz segment shall cause interference to, nor is protected from interference due to the operation of stations in, the space operation and space research services.

* * * * *

(h) No amateur station transmitting in the 23 cm band, the 3.3-3.4 GHz segment, the 3 cm band, the 24.05-24.25 GHz segment, the 76-77.5 GHz segment, the 78-81 GHz segment, the 136-141 GHz segment, and the 241-248 GHz segment shall cause harmful interference to, nor is protected from interference due to the operation of, stations authorized by other nations in the radiolocation service.

(i) In the 23 cm band, no amateur station shall cause harmful interference to, nor is protected from interference due to the operation of, stations in the radionavigation-satellite service, the aeronautical radionavigation service, the Earth exploration-satellite service (active), or the space research service (active).

* * * * *

(k) No amateur station transmitting in the following segments shall cause harmful interference to stations in the radio astronomy service: 3.332-3.339 GHz, 3.3458-3.3525 GHz, 76-77.5 GHz, 78-81 GHz, 136-141 GHz, 241-248 GHz, 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz, and 926-945 GHz. No amateur station transmitting in following segments shall cause harmful interference to stations in the Earth exploration-satellite service (passive) and space research service (passive): 275-277 GHz, 294-306 GHz, 316-334 GHz, 342-349 GHz, 363-365 GHz, 371-389 GHz, 416-434 GHz, 442-444 GHz, 496-506 GHz, 546-568 GHz, 624-629 GHz, 634-654 GHz, 659-661 GHz, 684-692 GHz, 730-732 GHz, 851-853 GHz, and 951-956 GHz.

(l) In the 9 cm band:

(1) In ITU Regions 2 and 3, the 9 cm band is allocated to the amateur service on a secondary basis. In ITU Region 1, the segment 3.4-3.475 GHz is allocated to the amateur service on a secondary basis for use only in Germany, Israel, and the United Kingdom.

(2) In the United States, the 9 cm band is allocated to the amateur and non-Federal radiolocation services on a secondary basis.

(3) In the 3.4-3.5 GHz segment, no amateur station shall cause harmful interference to, nor is protected from interference due to the operation of, stations in the fixed and fixed-satellite services.

* * * * *

(r) In the 4 mm band:

* * * * *

(2) No amateur or amateur-satellite station transmitting in the 75.5-76 GHz segment shall cause interference to, nor is protected from, interference due to the operation of stations in the fixed service. After January 1, 2006, the 75.5-76 GHz segment is no longer allocated to the amateur service or to the amateur-satellite service.

* * * * *

(t) In the 40 m band:

(1) The 7-7.1 MHz segment is allocated to the amateur and amateur-satellite services on a primary and exclusive basis throughout the world, except that the 7-7.05 MHz segment is: (i) additionally allocated to the fixed service on a primary basis in the countries listed in 47 C.F.R. § 2.106, footnote 5.140; and (ii) alternatively allocated to the fixed service on a primary and exclusive basis (i.e., the segment 7-7.05 MHz is not allocated to the amateur service) in the countries listed in 47 C.F.R. § 2.106, footnote 5.141.

(2) The 7.1-7.2 MHz segment is allocated to the amateur service on an exclusive basis in Region 2. Until March 29, 2009, the 7.1-7.2 MHz segment is allocated to the amateur and broadcasting services on a co-primary basis in Region 1 and Region 3 and the use of the 7.1-7.2 MHz segment by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. After March 29, 2009, the 7.1-7.2 MHz segment is allocated to the amateur service on a primary and exclusive basis throughout the world, except that the 7.1-7.2 MHz segment is additionally allocated to the fixed and mobile except aeronautical mobile (R) services on a primary basis in the countries listed in 47 C.F.R. § 2.106, footnote 5.141B.

(3) The 7.2-7.3 MHz segment is allocated to the amateur service on an exclusive basis in Region 2 and to the broadcasting service on an exclusive basis in Region 1 and Region 3. The use of the 7.2-7.3 MHz segment in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3.

Appendix B: Final Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Notice of Proposed Rule Making* (*Omnibus NPRM*) in ET Docket No. 04-139.[2] The Commission sought written public comment on the proposals in the *Omnibus NPRM*, including comment on the IRFA. No written public comments were received concerning the IRFA. This present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.[3]

A. Need for, and Objectives of, the Report and Order.

In the *Omnibus Report and Order*, the Commission amends Parts 2, 25, 73, 90, and 97 of its Rules in order to complete its implementation of various allocation decisions from the World Radiocommunication Conference (Geneva, 2003) (WRC-03) concerning the frequency bands between 5900 kHz and 27.5 GHz and to otherwise update its Rules in this frequency range. In general, these changes provide additional licensing opportunities and flexibility for Commission licensees, ***e.g.***, international broadcast stations are authorized the use of single sideband and digital transmissions – in addition to double sideband transmissions – in the HF bands between 5900 kHz and 26100 kHz that are allocated to the broadcasting service. The decisions adopted in the *Omnibus Report and Order* conform the Commission's Rules, to the extent practical, to the decisions that the international community made at WRC-03 and will collectively promote the advancement of new and expanded services and provide significant benefits to the American public.

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA.

There were no comments filed directly in response to the IRFA.

C. Description and Estimate of the number of Small Entities to Which the Final Rule Will Apply.

The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the rules adopted herein.[4] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction." In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act, unless the Commission has developed one or more definitions that are appropriate for its activities.[5] Under the Small Business Act, a "small business concern" is one that: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).[6]

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[1] *See* 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. §§ 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

[2] 19 FCC Rcd 6592, 6715 (2004).

[3] 5 U.S.C. § 604.

[4] *Id*. at § 604(a)(3).

[5] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small-business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

[6] 15 U.S.C. § 632.

A small organization is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[7] Nationwide, there are approximately 1.6 million small organizations.[8] "Small governmental jurisdiction" generally means "governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than 50,000."[9] As of 1997, there were approximately 87,453 governmental entities in the United States.[10] This number includes 39,044 county governments, municipalities, and townships, of which 37,546 (approximately 96.2%) have populations of fewer then 50,000 and 1,498 have populations of 500,000 or more. Thus, we estimate the number of small governmental jurisdictions overall to be approximately 84,098 or fewer.

Satellite Telecommunications. The SBA has developed a small business size standard for Satellite Telecommunications, which consists of all such firms having $12.5 million or less in annual receipts.[11] According to Census Bureau data for 1997, there were 324 firms in this category that operated for the entire year.[12] Of this total, 273 firms had annual receipts of under $10 million, and an additional twenty-four firms had receipts of $10 million to $24,999,999.[13] Thus, under this size standard, the majority of firms can be considered small.

Little LEO licensees operate non-geostationary mobile-satellite systems that provide non-voice services. There are two Little LEO licensees (ORBCOMM and Volunteers in Technical Assistance (VITA)) currently in operation. Another Little LEO licensee (Final Analysis Communication Services, Inc.) has expressed interest in the Little LEO feeder link bands, but it does not yet provide service. The last-listed licensee here is a small business, and the other two might also be small.

Licensees in the Earth Exploration-Satellite Service (EESS) provide remote sensing services. While there are currently no EESS licensees in the band 25.5-27 GHz, two companies (DigitalGlobe, Inc. and Space Imaging LLC) have expressed interest in using this band in the future. Neither of these EESS licensees (which currently operate in the band 8025-8400 MHz) are small businesses.

Wireless Service Providers. The SBA has developed a small business size standard for wireless small businesses in the category of Cellular and Other Wireless Telecommunications.[14] Under this SBA category, a wireless business is small if it has 1,500 or fewer employees. According to Commission data,[15] 975 companies reported that they were engaged in the provision of wireless service. Of these 975 companies, an estimated 767 have 1,500 or fewer employees and 208 have more than 1,500 employees.[16] Consequently, the Commission estimates that most wireless service providers are small entities.

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[7] 5 U.S.C. § 601(4).

[8] Independent Sector, The New Nonprofit Almanac and Desk Reference (2002).

[9] 5 U.S.C. § 601(5).

[10] U.S. Census Bureau, Statistical Abstract of the United States: 2000, Section 9, pages 299-300, Tables 490 and 492.

[11] 13 C.F.R. § 121.201, NAICS code 517410 (changed from 513340 in October 2002).

[12] U.S. Census Bureau, 1997 Economic Census, Subject Series: Information, "Establishment and Firm Size (Including Legal Form of Organization)," Table 4, NAICS code 513340 (issued October 2000).

[13] *Id.*

[14] 13 CFR § 121.201, NAICS code 517212.

[15] FCC, Wireline Competition Bureau, Industry Analysis and Technology Division, Trends in Telephone Service at Table 5.3, page 5-5 (May 2004). This source uses data that are current as of October 22, 2003. These estimates include paging.

[16] *Id.*

Licensees in the Fixed and Mobile Services in the band 7350-7400 kHz provide conventional Industrial/Business Pool services (41 licensees with 102 licenses), operate Alaska private-fixed stations (11 licensees with 18 licenses), and operate coast stations (3 licensees, each with a single license). We believe that some of the licensees providing conventional Industrial/Business Pool services are small businesses; that almost all of the licensees providing Alaska group services are small businesses; and that all of the licensees providing coast station services are small businesses.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements.

The final rules require that:[17]

- After March 29, 2009, authority to operate in the band 7350-7400 kHz shall not be extended to new non-Federal stations in the fixed and mobile except aeronautical mobile services. After March 29, 2009, non-Federal stations in the fixed and mobile except aeronautical mobile services shall: (1) be limited to communications wholly within the United States and its insular areas; (2) not cause harmful interference to the broadcasting service; (3) be limited to the minimum power needed to achieve communications; and (4) take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article 12 of the ITU *Radio Regulations*.

- Licensees in the Non-Voice Non-Geostationary Mobile-Satellite Service that use the bands 1390-1392 MHz and 1430-1432 MHz for feeder links (Little LEO feeder links) operate on a secondary basis. The completion of ITU-R studies on all identified compatibility issues as shown in Annex 1 of Resolution 745 (WRC-2003) are required prior to the use of the Little LEO feeder links. Any use of these feeder link allocations are subject to further compatibility decisions by 2007 World Radiocommunication Conference. Engineering skills would be needed in order to perform the required studies.

- EESS applicants in the band 25.5-27 GHz are required to do a technical analysis of the interference potential between their proposed operations and Federal operations, *i.e.*, an electromagnetic compatibility analysis.[18] Engineering skills would be needed in order to perform the analysis. The power flux-density at the Earth's surface produced by emissions from an EESS space station must be in accordance with the ITU *Radio Regulations*.

E. Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered.

The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[19]

The Commission reallocated the band 7350-7400 kHz from the fixed and mobile services to the broadcasting service, effective March 29, 2009, and will cease issuing licenses for new stations in the fixed and mobile services as of that date. The phase-in of these rules provide affected entities, including small entities, with a reasonable amount of time in which to relocate to other spectrum allocated to the fixed and mobile services, thus minimizing the impact of our actions. In addition, the new broadcasting service allocation will provide new opportunities for international broadcasters that are small businesses.

[17] *See also Omnibus Report and Order* at para. 2 (Executive Summary).

[18] *See id.* at paras. 87-88.

[19] 5 U.S.C. § 603(c).

The Commission had conditionally allocated the Little LEO feeder links on a primary basis, subject to the outcome of WRC-03. At WRC-03, the United States was unable to secure a primary allocation, but was able to garner conditional support for a worldwide secondary allocation for Little LEO feeder links. Based on the international allocation, the Commission has changed the allocation status of the Little LEO feeder links from primary to secondary. Because the Commission has not yet licensed the Little LEO feeder links, no licensee is directly impacted by this decision. Continued allocation for Little LEO feeder links in this band will provide opportunities for small businesses within the context of international agreements.

Report to Congress: The Commission will send a copy of the Report and Order, including this FRFA, in a report to Congress and the Government Accountability Office, pursuant to the Congressional Review Act.[20] In addition, the Commission will send a copy of the Report and Order, including the FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the Report and Order and FRFA (or summaries thereof) will also be published in the Federal Register.[21]

[20] *See* 5 U.S.C. § 801(a)(1)(A).

[21] *See* 5 U.S.C. § 604(b).

Appendix C: Filings in ET Docket No. 04-139

Comments:

1. ARRL, the National Association for Amateur Radio (ARRL)
2. Final Analysis Communication Services, Inc. (Final Analysis)
3. KROHNE, Inc. (Krohne)
4. Leggett, Nickolaus E. (Leggett)
5. National Association of Shortwave Broadcasters (NASB)
6. Brown, James F (Brown; listed in the ULS as "james f Rbown")
7. Space Imaging LLC (Space Imaging)
8. Whedbee, James

Late-Filed Comments:

1. American Samoa Amateur Radio Association (ASARA); filed on July 21, 2004

Reply Comments:

1. ARRL
2. ASARA
3. Gandy, Larry G.